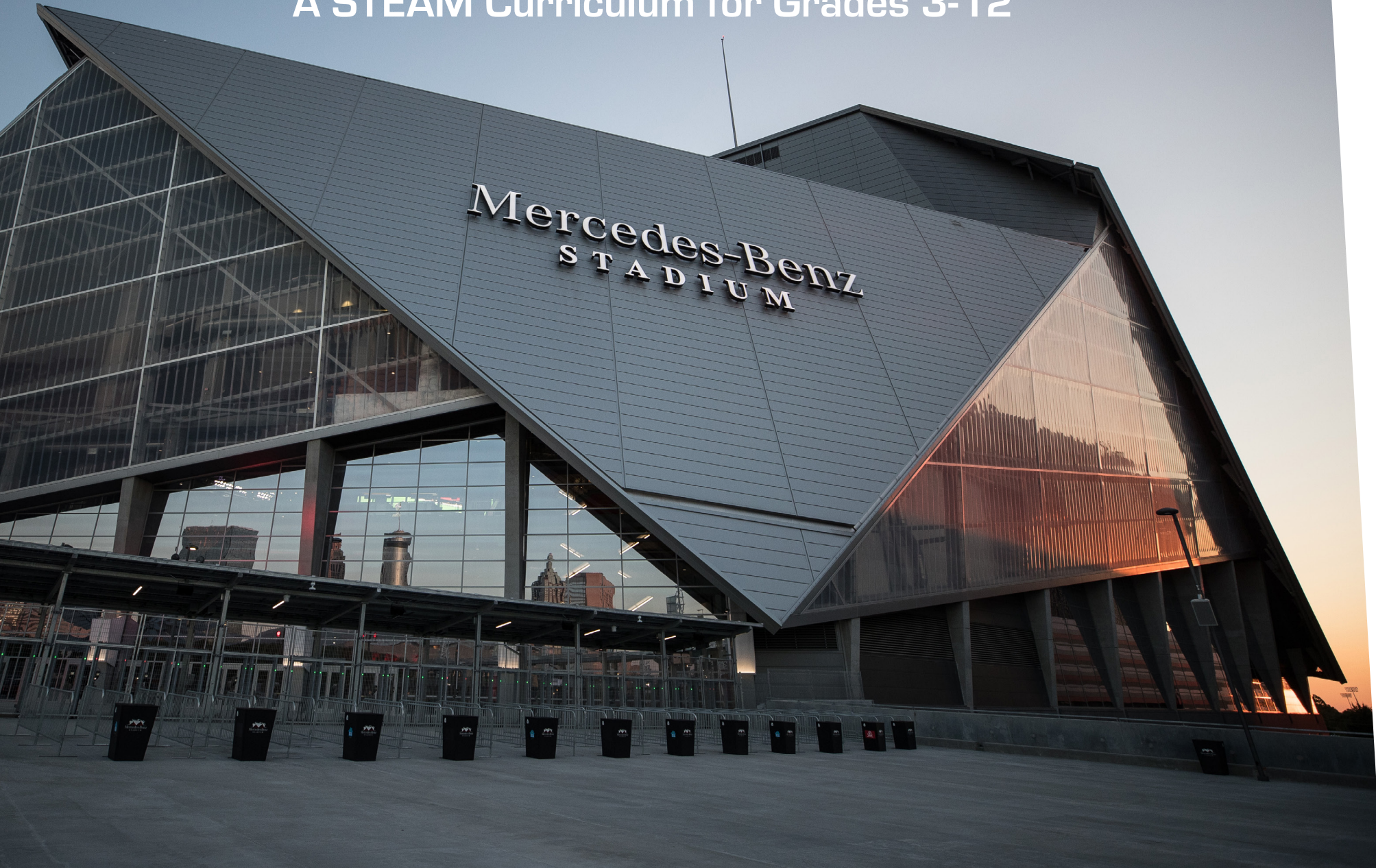


Mercedes-Benz STADIUM

A STEAM Curriculum for Grades 3-12





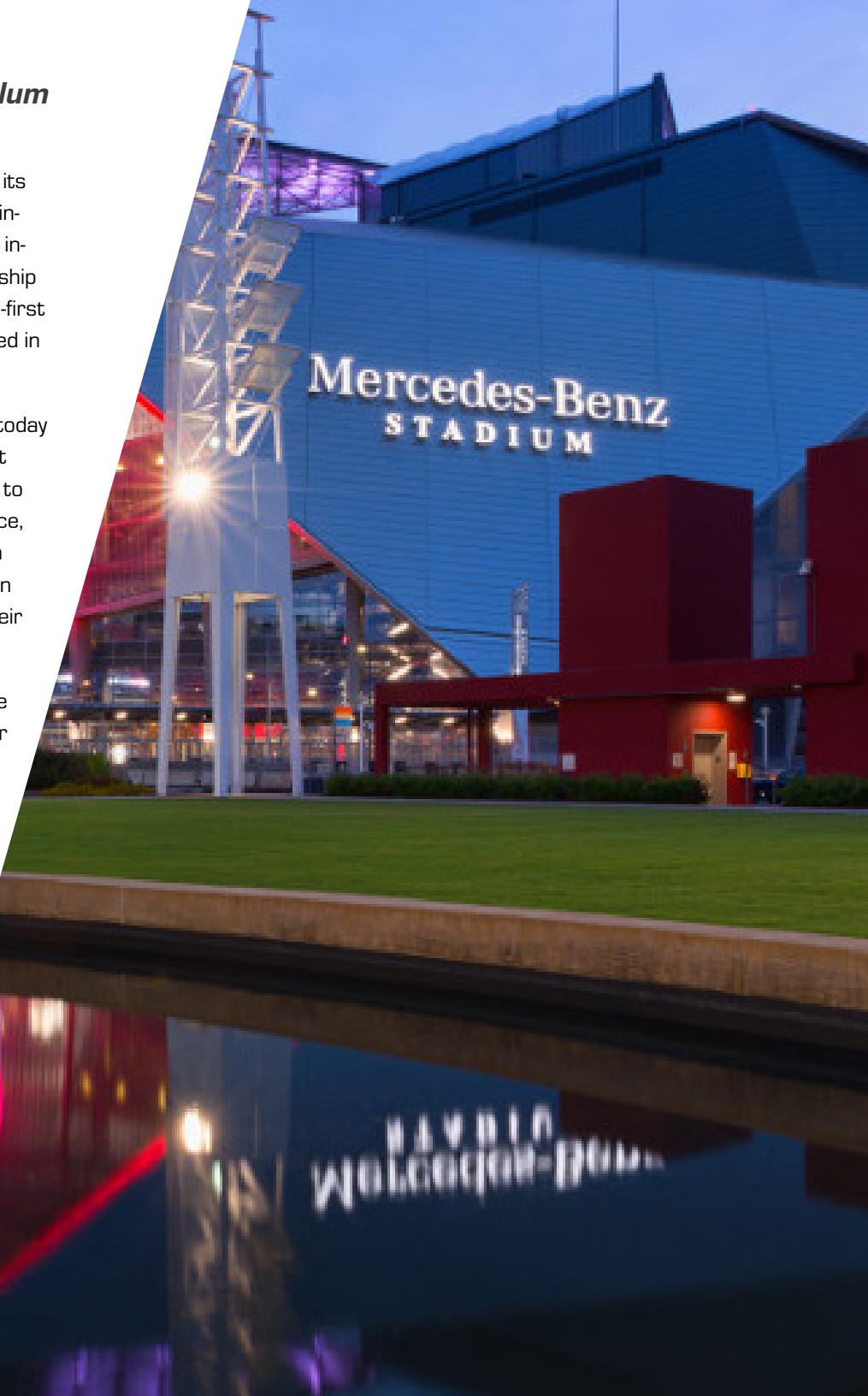
An Introduction to the Mercedes-Benz Stadium Curriculum

More than 200 large stadiums serve sports teams – and their fans - across the United States. But none is quite like Mercedes-Benz Stadium in Atlanta, Ga. From its inception, the goal for the facility was to stand above the rest, particularly in sustainability, fan experience and positive community impact. With accomplishments that include a LEED Platinum rating by the U.S. Green Building Council, a thriving partnership with Westside Works (a community and workforce development organization), fan-first pricing and a world-class art collection, owner Arthur Blank and his team succeeded in their vision.

Just as Mercedes-Benz Stadium was creatively designed for the future, students today are preparing for the world of tomorrow, where many will have careers that do not yet exist. Therefore, our approach to the Mercedes-Benz Stadium curriculum was to focus on the same priorities as the stadium builders while creating STEAM (Science, Technology, Engineering, Art and Mathematics) lessons that align with the Georgia Standards of Excellence (GSE). Lessons for each grade level include two focused on STEM subjects and one on Art & Design, with opportunities for students to flex their creativity embedded throughout.

As educators we understand each class is different, so we wrote the lessons to be adaptable, providing flexibility for teachers to apply the curriculum appropriately for their classroom's teaching and learning needs. Each lesson includes the relevant state standards; instructional guidelines for before, during and after a stadium tour; an extension section that adds a more challenging layer to the lesson; a shortened version for a quick learning experience; a service learning application; and possible career connections.

The goal for the curriculum was to create a guide for educators to use in connection with a Mercedes-Benz Stadium experience that celebrates the uniqueness of the space. We encourage both teachers and students to see the stadium not only as a fun and energy-filled space, but also a place filled with amazing and real-world, STEAM learning opportunities. We feel that it is essential for students to understand that learning transcends the walls of the classroom. The Mercedes-Benz Stadium is an ideal space to function as a relevant and exciting learning lab, so have fun with the curriculum and with your experience at the stadium!



NOT A WASTE

Life Science

Standards: S3L2.b.

Game Plan

In this experience, students will:

- learn about the how Mercedes-Benz Stadium is sustainable and environmentally friendly, and
- use knowledge of recycling to promote recycling programs within their own school and community.

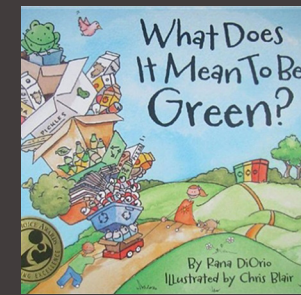
Driving Question

How can we educate fellow students and community members on the importance of recycling, as well as what materials can be recycled?

Materials Needed

Gloves, sketchbook or notebook, pencil

Pre-Game



Literature Connection

What Does It Mean to be Green? is about sustainability and gives students ideas about how to be environmentally friendly in everyday tasks.

Save the refuse in the waste bin from the day before. Wearing gloves, go through it and show students all of the materials that get thrown away in the course of a day. Ask students what else they might expect to find in a trash can or dumpster.

Discuss the concepts of reducing waste, reusing materials, and recycling what cannot be used again. As a class, create a chart of materials that can or cannot be reused or recycled. In the section of items that cannot be reused or recycled, brainstorm ideas for ways to replace those materials with some that can be recycled or reused.

In Motion

The Mercedes-Benz Stadium is the most sustainable sports venue in the world. During the tour, students will learn:

- MBS is a LEED Platinum Building which means that it is energy and resource efficient, and healthy to live in.
- They will see edible landscape that will be used by culinary students to feed the community.
- The stadium uses 29 percent less energy than traditional stadiums due to the use of solar panels.
- The stadium collects rainwater to use in landscaping and in cooling towers. Also, by collecting the rainwater, it helps control flooding in the surrounding community.

Focus students' attention on how the stadium deals with waste. Are there recycle bins present? Do they list what materials can go in them?

Students can sketch, note or just observe these and other ways that the stadium is environmentally friendly.

Post-Game

Students will observe fellow students' behavior at their school to see what materials they use and how they dispose of them. Students will then research what options are available for recycling in their local community. Based on what they find, students will create a poster for the school focusing on either reducing waste, reusing materials or recycling. Students may present these posters to peers in lower grades before hanging the posters around the school.

Up Your Game

Have students write letters asking if they can present their recycling and conservation ideas during a city council or school board meeting to encourage waste reduction in local schools.

Fun Fact

The stadium's 71,000 seats are made from recycled plastic.

Fast Break

After learning about how environmentally friendly the stadium is, encourage students to find a problem that they can solve in their community. Maybe they can pick up trash, recycle milk cartons at school, collect cans or other recyclable materials to raise money for an organization in their community, etc.

Beyond the Game

Atlanta is home to many different recycling programs – from curbside recycling pick-up to the Center for Hard to Recycle Materials. However, improper preparation of materials for recycling and throwing away materials that are recyclable are both common problems. As a class, the students can host a community forum to help educate neighbors about the importance of recycling and the proper way to do so. Students can get active in events such as the “Great American Cleanup” to motivate parents, classmates and other community members to not only pick up trash, but also differentiate between trash and recycling.



Career Connection

Truck Driver - Picks up discarded recycled materials. This job requires a high school diploma and certification to handle large recycling trucks.

Recycle Coordinator - Manages and supervises the details of recycling programs such as schedules, shipments and how to properly handle hazardous wastes. This job requires a high school diploma and on-the-job training.

Urban and Regional Planner - Develops and designs plans for the use of land and physical environments in towns, cities and large metropolitan areas. This career requires a bachelor's degree and usually a master's degree.

THE SHAPE OF DESIGN

Geometry

Standards: MGSE3.G.1; MGSE3.

Game Plan

In this experience, students will:

- learn about the how the roof of the stadium is a collection of shapes that share attributes,
- explore Mercedes-Benz Stadium and see how many shapes they can find in the construction of the building,
- recognize that defined shapes can be partitioned into areas of equal size such as the rectangular shape of the field being divided into yards, and
- collaborate with others to test materials and build a unique display by working through the steps of engineering.

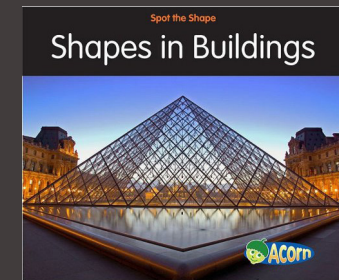
Driving Question

How can different categories and attributes of shapes be used to create and partition a community garden?

Materials Needed

Sketchbook, pencil, tangram or cut-out shapes

Pre-Game



Literature Connection

Shapes in Buildings can be used to get students thinking about the shapes that are used in building construction. Students

can begin to identify different shapes in the buildings of this book before they visit the stadium.

Discuss with your students the following questions:

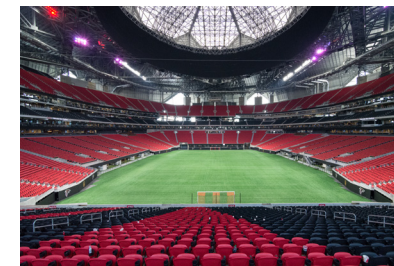
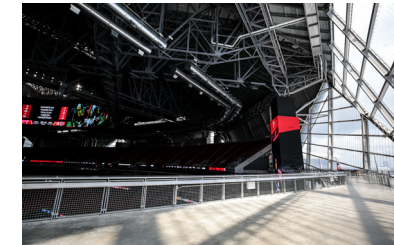
- What shapes do you know?
- What attributes do these shapes have?
- How can we group these shapes?

Write down their responses or let students make a display of their group discussion. Share these discussions.

After thinking about shapes, begin to transition into a discussion of the following:

- How are shapes used to create the objects that we use and interact with?
- Where in your community do you see various shapes at work?

Students will look at the following pictures and talk about the shapes that are used in Mercedes-Benz Stadium. Discuss how these shapes might be grouped and what attributes they share.



In Motion

During the tour, students can sketch or keep a tally of the shapes they find used throughout the structure of Mercedes-Benz Stadium. Stop and point out

Post-Game

Building on their inspiration from seeing Mercedes-Benz Stadium, students will test the following questions:

- How can you use your understanding of shapes and their attributes to create a community garden that can be accessed by all members of the community?

- How can those shapes be partitioned to provide equal growing space for each participating community member or crop?

Students will work through the steps of engineering by planning, testing materials, building, testing, and revising or rebuilding as needed. When they present their designs, the students will discuss the effectiveness of the chosen shape(s) in meeting community members' accessibility needs.

Students should focus on both the attributes of the shape of the garden as well as the shape of pathways.

Students will also discuss how they plan to partition their shapes into parts with equal areas. Example: Garden bed one has four equal areas for four members of the community to plant their chosen crops.

Up Your Game

Students can design their garden using a graphic design program, or by using tools and materials that will stretch their thinking. Students may also use design software to incorporate more advanced structures such as a garden shed, lean-to or cold frames. Some programs to consider include Adobe Photoshop, InDesign or Illustrator; GIMP; or Corel Draw.

Fun Fact

Approximately 27,000 tons of steel was used to build Mercedes-Benz Stadium!

Fast Break

After talking about the shapes that they see during the stadium tour, use tangram shapes or cut out shapes to create a display or design that represents Atlanta. Then, have students write fractions for the shapes included in their design. Example: $\frac{3}{19}$ of my shapes are rhombuses.

Beyond the Game

Many urban communities are creating green spaces or neighborhood gardens where residents who live in apartments can have a place to grow nutritious food for their family and engage with their neighbors. Students can help community members maintain plots in the garden they have created or facilitate crop trading among community members. They can also grow food in their own sections to donate to local food banks or provide meals for local homeless communities.



Career Connection

Graphic Designer - Creates layouts for various design projects such as advertisements, magazines and reports. They often do their work using computer software. This job may require a bachelor's degree in graphic design, but some graphic designers are self-taught.

Landscape Designer - Designs outdoor spaces for people to enjoy such as parks, gardens and campuses. Working in this field requires a bachelor's or master's degrees in landscape architecture.

Structural Engineer - Works closely with architects to ensure that buildings, bridges and other structures remain stable and secure throughout their use. Working as a structural engineer requires a bachelor's degree in structural or civil engineering.

Architect - Creates designs for houses, commercial buildings and a variety of other structures. A bachelor's degree as well as a special license are required to work as an architect.



FALCON FRENZY

Visual Art; Science

Standards: VA3.CR.1.a,b,c; VA3.CR.2.a; VA3.CR.3.a,d; VA3.PR.1.b; VA3.RE.1.d; VA3.CN.1.c S3L1.c

Game Plan

In this experience, students will:

- learn about Georgia artist John Cornbread Wilson and how he creates paintings that connect his childhood memories to animals that are native to Georgia,
- understand and discuss the adaptations of falcons,
- observe and document the many ways that the falcon is represented visually in Mercedes-Benz Stadium,
- collaborate with a partner to discuss how the adaptations of a falcon in nature make them a good mascot for a sports team, and
- create a drawing or painting of a falcon that connects the animal to their experience at Mercedes-Benz Stadium.

Driving Question

How can I design my own image of a falcon based on my experience at the Mercedes-Benz Stadium?

Materials Needed

Sketchbook, pencil

Pre-Game

Explain to students the concept of animal adaptations. You can show them this [pdf](#) to provide examples. Ask questions such as what is adaptation? Why is it important? What would happen if animals did not adapt? Do people adapt?

Share this [fact sheet](#) with your students and have them talk about why the various adaptations included are important.

Now share this [website](#) with your students. Tell them that you are showing them this information about falcons because it is the mascot for Atlanta's NFL team. If possible, pass out images of falcons and have the students work in pairs to find evidence of the adaptations they discussed earlier.

Finally, introduce the students to the Georgia-based artist [John Cornbread Anderson](#). Be sure to highlight that his paintings are based on his experiences with the habitats of the animals that he paints. As you are showing examples of his work, discuss with the students how the animals' adaptations are depicted. How are the animals painted? Are they lifelike? What types of traits are emphasized? What are some of the environments shown in the paintings? How do you feel when you see these paintings? Why do you think that is?

Before you leave for the stadium, instruct the students to pay close attention to all of the images and sculptures of falcons they will see while there. Have them take a sketchbook or scratch paper to create some sketches of what they see. Tell them that they will use these sketches for a bigger project when they return to the classroom.

In Motion

Remind the students to pay close attention to all of the images and depictions they see of falcons as they tour the stadium. Have them think about the following questions:

- Can you see any of the adaptations that we talked about in class?
- What colors are used?
- What types of materials are used?
- What environments are the falcons in?
- Are the depictions of falcons good ones to represent a team? Why or why not?
- How do the different images and sculptures of falcons make you feel?

Post-Game

- Remind the students of the artwork that they looked at by John Cornbread Wilson. If possible, show some examples. Also, have the students get out their sketches and notes from the stadium tour of the different depictions of falcons that they saw while there.
- Place students in pairs or small groups and instruct them to compare their sketches. What similarities are there? What differences? Have the students discuss with their partner(s) their favorite image or sculpture of a falcon that they saw. Why was it their favorite? How did it reflect the environment of the stadium? How did it represent a team?
- Next, have the students create a painting or drawing of their own falcon. Their artwork should reflect the environment of the stadium, either inside or out. They should also include at least one of the adaptations that they previously learned about and how it positively represents a team.

- Once they have finished, they should create an artist statement that explains what kind of environment they chose for their falcon, what adaptation(s) they chose to include, and how it positively represents a team.

Up Your Game

Once the students have finished their falcons' projects, take photos of each of them and upload them into a collage app such as PicCollage. Once you have made your collage, print it and hang it in the classroom! Discuss with your students the differences and similarities that they see in the artworks. Invite the students to talk about how their experience at the stadium affected the way that they chose to draw/paint their falcon.

Fun Fact

Did you know that a high school teacher won the contest to choose the mascot for Atlanta's football team? Although many people suggested the falcon, her explanation of why that bird was the perfect choice won over team officials. The teacher, Julia Elliot, stated, "The falcon is proud and dignified, with great courage and fight. It never drops its prey. It's deadly and has a great sporting tradition."

Fast Break

As you tour the stadium, have students pay attention to the various paintings, drawings and sculptures of falcons that they see. Instruct them to create some sketches of the falcons in their sketchbooks or on scratch paper. Have them make a note of which one was their favorite.

When they are finished, invite each student to share their falcon sketches with the group, and explain which was their favorite and why. Some questions to ask might include:

- What are some of the traits that you notice in the falcons that you saw?
- How were they similar?
- How were they different?
- Are there places in the stadium that you think should have more drawings/sculptures/pictures of falcons? Why?
- What makes a falcon a good mascot for a team?

Beyond the Game

The falcon, also known as a bird of prey, is one of Georgia's native birds and is an important part of maintaining a balanced ecosystem. There is an organization in Georgia dedicated to native wildlife called [AWARE \(Atlanta Wild Animal Rescue Effort\)](#). Their mission is to rehabilitate injured and orphaned native wildlife, and to educate the community about habitat preservation and peaceful coexistence. AWARE is one of the few centers in Georgia that rehabilitates all wildlife species.

Introduce your students to the AWARE website, and talk to them about their mission and work. Have your class choose an animal from the site to adopt. As a class, find creative ways to raise money for your animal! Have the students work together to create educational materials for their friends, family and school community to encourage donations.

**Career Connection**

Sculptor - Creates three-dimensional artwork from various materials such as metal, clay and wood. Educational requirements for this profession

vary from mentorship/training to a bachelor's or master's degree.

Welder - Joins metal parts together with a torch. This job requires a great deal of on-the-job training, or classes in high school or at a community college.



HOW DO YOU COMMUNICATE?

Earth Science

Standards: S4P1.a,b,c; S4P2.a,b

Game Plan

In this experience, students will:

- learn about the how designers use light and sound to communicate,
- explore Mercedes-Benz Stadium, and see how they use displays of light and sound to communicate information about events and vendors in the stadium, and
- work through the engineering process to create a unique display of light and sound of their own.

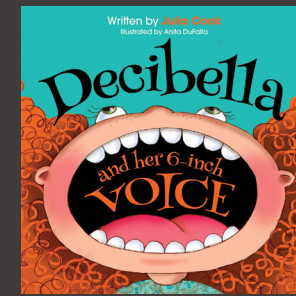
Driving Question

How can you use your understanding of light and sound to design and construct a device that can communicate across a distance?

Materials Needed

Images of lights (e.g. traffic signals, police lights, etc.), sound recordings (e.g. ambulance, music, everyday sounds, etc.), objects that reflect light or are transparent (e.g. mirror, glass of water, prism, etc.), and objects for making sounds

Pre-Game



Literature Connection

Decibella is a fun story about a girl who has different volumes of her voice for different situations. The story can be used to start

a conversation about communication, and the impacts of sound and light can be included in the discussion.

Show your students images of lights such as traffic signals, police lights, a glowing television and a score board. Then play sound clips such as an ambulance or the music that the local baseball team plays when they score a run. Discuss with

students the messages they receive just from seeing the lights or hearing certain sounds.

Next, investigate how light and sound travel. Provide everyday objects such as a pair of glasses, a prism, a mirror or a glass of water. Also provide tuning forks and other everyday materials that produce sound. Allow students to move from station to station experimenting with how light and sound move and the messages they convey. Come back together as a large group and discuss what students discovered.

In Motion

During the tour, students will see how light and sound create messages for event attendees through something as advanced as the Halo video display or something as simple as restaurant lighting and exit signs. Ask them to imagine the stadium quiet and without all of the extra lighting. What kind of difference would that make? How would it affect the visitor's experience?

Post-Game

Talk about the different lights and sounds that students experienced while on their tour at Mercedes-Benz Stadium. Next, have them decide how they want to convey a message – either through light, sound or by using both.

Students will design, plan and construct a project that either communicates a message through light or sound. They may use objects such as Light Brites to create signage or use materials such as guitar strings or recordings to deliver a message via sound.

Up Your Game

Once students have created their communication device, they will design an advertisement targeting the individuals or industry that they think would use their device. These ads should be professional in quality and the audience should be considered. If possible, have the students create a commercial for the product.

Fun Fact

The Halo video display has 37-million LED lights in a 360° display that's 58' tall and 1100' long.

Fast Break

While enjoying the tour and taking in the displays, have students spend about five minutes thinking about how a display like the Halo or the Mega Column could be used in your school or community. What would it display? What communication would it share?

Beyond the Game

Many communities need to share information quickly and efficiently. Tornado sirens, messages on television, flashing signs and texts are used to communicate. How could you use light and sound to help citizens in your community communicate with each other? What is some-

thing that is important for everyone to know about? How would you get the message into the homes of each family?



Career Connection

Lighting Engineer - Develops energy-efficient lighting such as LED lights and other technologies. Working in this field requires a high school diploma and bachelor's degree in electrical engineering.

Commercial Lighting Technician - Responsible for unloading and moving lighting equipment, installing and calibrating lighting systems, and making sure all gear is fully functional. This career requires a high school diploma and on-the-job training.

Electrician - Installs and maintains wiring, control and lighting systems. Inspects electrical components, such as transformers and circuit breakers, and uses different tools to identify electrical problems. This career requires a high school diploma and various professional licenses to advance.

Audio Engineer - Works with the technical aspects of sound during audio recordings or productions. This job requires a high school diploma plus a certificate from a vocational school or community college. In some cases, a bachelor's degree may be needed.

Audio Video Technician - Operates and maintains audio and video equipment such as scoreboards, microphones and sound-mixing boards during live events. This career requires a high school diploma and, in some cases, a bachelor's degree and hands-on experience

Stage Lighting Technician - This career involves rigging stage sets and controlling electric lights for theaters, concert halls and other entertainment venues. Working in this field requires a high school diploma and, in some cases, a bachelor's degree and hands-on experience.

AREA FOR ALL

Geometry

Standards: MGSE4.MD.1.b; MGSE4.MD.2; MGSE4.MD.3; MGSE4.MD.8

Game Plan

In this experience, students will:

- understand the relative size of measurements such as yards, feet and inches,
- create a scale model of a segment of stadium seating,
- use area and perimeter to denote sizes,
- use fractions to equally space seating throughout an area, and
- understand that a scale model is proportionate to its real-life counterpart.

Driving Question

How can you use knowledge of area and fractions to design a scale representation of a portion of the stadium seating?

Materials Needed

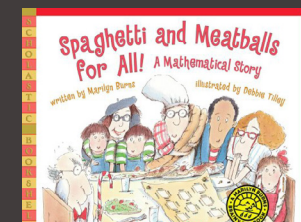
Measuring tape, graph paper, pencil, ruler

Pre-Game



Literature Connection

Cool Architecture features images and fun facts about architecture around the world – from simple dwellings created by the earliest humans to today’s most innovative buildings.



Spaghetti and Meatballs for All! introduces children to the concepts of area and perimeter as they follow the Comfort family’s attempts to arrange tables and plates for all the

guests at their spaghetti dinner.

As a class, examine a ruler, a meter stick and a measuring tape. Discuss what the lines along the measuring tools mean. Ask students which units of measurement are familiar to them, and make a list of those on the board with their approximate sizes denoted next to them. Next, have students consider which unit(s) they would use to measure a desk, multiple desks or the whole room.

Direct students’ attention to the space in the classroom and how it is used, including space to walk as well as spaces for furniture. Ask students how the architect designing the school determines what size a classroom should be. An example of a student response might be that the architect knows the size of a desk and how many students each room must accommodate. Explain to students that architects must calculate the total size of the room, called area. Area is found by multiplying the length and width of a space. When you measure the distance along all four sides of a room, it is called perimeter. Students should practice these concepts by measuring the sides of the room and calculating its area and perimeter.

Return to the line of questioning about desks and spacing. Tell students that, prior to each year, you must decide how to place enough desks with correct spacing for all students. Show them how to measure each desk’s length and width as well as the space needed to walk between desks, then compare it to the area of the classroom.

In Motion

During the tour, place special focus on the stadium seating. Students should form groups and pick one section of the stadium seating to focus on for their calculations. In their chosen area, groups should use their measuring devices to measure the width and depth of each seat, the distance between seats from left to right, and the distance between the back of one seat and the front of the seat behind it. Students should also count how many seats are in a row and how many seats are in a column.

Post-Game

Students will create a scale representation of their chosen section. First, they need to calculate the area of their section using the measurements they collected while on the tour.

Students will use a complex equation to add the width of the seat plus the space between seats from left to right, then multiply by the number of seats in the row to find the total measurement of length on one side of the rectangle. Students will then use a similar calculation to find the total measurement of length for the other side of the rectangle. When they’ve completed the two measurements, they can then multiply to find the total area.

Once students have determined the area of the actual seating section, they can decide as a group what scale they’d like to use for their model representation. Students should calculate the correct scale using ratios, then begin drawing their model including seats. The scale model must include a measurement scale for comparison.

Up Your Game

Use design software or graph paper to reorganize a space you are familiar with such as your bedroom or classroom. Take into account the size of the room and the measurements of the furniture contained in it. Include a scale to ensure everything fits correctly.

Fun Fact

The Mercedes-Benz Stadium can seat 71,000 attendees during football and soccer games.

Fast Break

Challenge the students’ multiplication skills by asking them to find the number of seats in a given section by multiplying the number of seats in a row by the number of seats in a column.

Beyond the Game

Areas where members of the community can gather for meetings or recreation are an important part of building strong neighborhoods. Estimate the number of people in your neighborhood by counting the number of houses on your street or the number of apartments in your complex. Design a community room big enough to hold the people in your neighborhood. You can use your seat measurements and spacing to help you determine how much room each neighbor will need. Include a scale to show the measurements of the room and seating. Come up with ideas for how this community space can be used to improve the lives of your neighbors and encourage closeness within your area.



Career Connection

Event Planner - Plans weddings, parties, grand openings, conventions and other types of events by organizing details such as the location, food and entertainment. A minimum of a high school diploma and on-the-job training is needed; a bachelor's degree in a hospitality field is recommended.

Community Organizer - Coordinates campaigns led by local residents to promote the interests of their community. Can be from any background, with education ranging from a high school diploma to a professional degree such as a lawyer or doctor.

Architect - Creates designs for houses, commercial buildings and a variety of other structures. A bachelor's degree as well as a special license are required to work as an architect.



BATTLE OF THE RESTAURANTS

Art & Design

Standards: VA4.CR.1.a,b; VA4.CR.2.b; VA4.CR.3.a,d; VA4.RE.1.d; VA4.CN.2.c

Game Plan

In this experience, students will:

- collaborate with one another to create a design for a restaurant that they feel would be a good fit for Mercedes-Benz Stadium,
- illustrate their understanding of strong marketing techniques with the creation of a flyer and slogan for their restaurant, and
- collaborate to create a presentation to try and “sell” their restaurant idea.

Driving Question

If I were to design a restaurant for the Mercedes-Benz Stadium, what would it look like? What types of food would I serve? Would it have a theme?

Materials Needed

Sketchbook, pencil

Pre-Game

Ask students to write down their favorite restaurant. When they are done, have them read their choices aloud, and group students together that listed the same restaurant. If there are one or two large groups, split them into smaller groups.

Once they are in their groups, ask students to talk about the reasons why they chose their restaurant. Choose one student from each group to take notes. As they are creating their list, ask them to think about all of the aspects of the restaurant such as the food, what it looks like on the inside, what it looks like on the outside, how the tables are arranged, what types of decorations are displayed, etc. In addition, ask if they have ever seen a commercial or flyer about that restaurant. If so, what do they remember about that commercial/flyer? What part of the restaurant was highlighted?

Once each group has finished, collect their papers so that they will have them when it is time to work on the project following their tour of Mercedes-Benz Stadium.

Next, talk with the students about the different places to eat within Mercedes-Benz Stadium, particularly the restaurant Molly B’s. If possible, use this [link](#) to show a few images of the restaurant. Ask students to talk about what they see in the pictures. What makes this a place that people want to eat? What is special about the restaurant? Do these pictures make you want to eat there? Why or why not?

Now, show the students this [video](#) from the Mercedes-Benz Stadium YouTube channel. Afterwards, ask the students about what stood out to them in the video and why.

Lastly, talk with your students about the tour that they will be taking of the stadium. Instruct them to take a sketchbook or some paper and a pencil with them. As they go through the tour, they should pay close attention to all of the different places to eat. Tell them to keep the following in mind as they proceed throughout the spaces:

- What types of foods are available?
- How are the restaurants/food spaces designed?
- What kinds of pictures are included?
- What colors are used?
- Which ones would I want to eat at and why?
- What would I do differently?

Tell them to create sketches and notes based on the different restaurants and food spaces that they see on the tour. They will need that information for the project they will create once back at school.

In Motion

Once you arrive at the stadium, make sure the students have their sketchbooks and something to write with. Remind them to pay close attention to the details of all of the restaurants and dining spaces within the stadium and to take notes and make sketches of the ones that stand out the most to them.

Post-Game

Have the students take out their notes/sketches from the stadium. Ask some of the students to share which ones they were drawn to. What did they like most about it? What kind of food was served? How was it designed? What about it fit well within the stadium?

Now, divide the students into small groups or pairs. With their partner(s), they will design a restaurant that they think would be a good addition to Mercedes-Benz Stadium.

Tell them to keep the following in mind as they design their space:

- What kind of food will you serve?
- What kind of color scheme will you use?
- What materials will you use in your design?
- Will you include any images or symbols?
- Will you have a theme?
- How will it fit in with the rest of the spaces in the stadium?
- How will it be different?

Encourage groups to keep the [principles of design](#) in mind as they create their spaces. They can create their designs in any medium – from pencil and paper to a 3D model. If they choose to create a 3D model, they should begin with preliminary drawings of their plans before proceeding.

Once they have finished with their design, they need to think about how they would market their restaurant. Have them think back to the discussion about their favorite restaurant that you had before going to the stadium. What kinds of commercials or other advertisements have you seen for that restaurant? What about it made it appeal to you? Does the restaurant have a slogan?

Instruct the students to create a flyer and a slogan for their restaurant. Have them pretend that they are trying to convince the Mercedes-Benz Stadium that their restaurant design is the best and should be included in the stadium.

When finished, each group should present their designs to the class, starting with their flyer and slogan. Encourage the other students to ask questions about their designs and give feedback. For an added layer of fun, display the designs and flyers in the school and have other students vote on their favorite.

Up Your Game

Once students have completed their restaurant designs, have them create a commercial. Tell them that they are trying to secure votes so their restaurant can be added to Mercedes-Benz Stadium. Turn it into an actual contest and create an award for the winner.

Fun Fact

Molly B's was named after the mother of Arthur Blank, owner of the Atlanta Falcons and Atlanta United. Her name was Molly Blank, and she was a positive influence in his life. The decision to dedicate the restaurant to Mr. Blank's mother was actually a surprise for him, and he was honored by the decision.

Fast Break

While you are touring the stadium, have students pay close attention to all of the dining spaces and the restaurant. Have the kids pretend that they are in a competition to design the next restaurant that will be included in the stadium. Give them five minutes to come up with a theme and a slogan that would win the contest.

Beyond the Game

Hunger has – and continues to be – a serious issue in our country. Organizations such as the Atlanta Community Food Bank, however, are working to help those in need. There are an estimated 755,400 people in the metro Atlanta and North Georgia areas that turn to food pantries or meal services for food. The Atlanta Community Food Bank provides food to area food kitchens, pantries and meal services. With your class, visit their website and read about the different ways that your students can help the food bank. From organizing a food drive to planting a garden to donating food, there are many ways to raise awareness and give back.



Career Connection

Chef - Responsible for the kitchen in a restaurant, including overseeing the menu, and food preparation and presentation. The requirements for this job

can range from on-the-job training to a degree from a culinary institute.

Carpenter - Works in the construction industry to build and create things from materials such as wood and steel. This job requires on-the-job training or a certificate from a technical or trade school.

Interior Designer - Makes interior spaces functional, safe and aesthetically pleasing. This job typically requires a bachelor's degree and at least two years of on-the-job training.



WE CAN WORK TOGETHER

Earth Science

Standards: S5E1.a; S5E1.b; S5E1.c

Game Plan

In this experience, students will:

- critically think about surface features that are caused by constructive and destructive forces,
- examine what feature(s) the Mercedes-Benz Stadium used to prevent destructive forces from harming the local landscape, and
- create a structure that will work with the Earth to be able to withstand and even alleviate some of the effects of the destructive forces.

Driving Question

How can structures we create work with the Earth's forces and natural processes to ensure longevity and support the community?

Materials Needed

Sketchbook or notebook, pencil, technology for planning and research

Pre-Game

Have students watch a short video about weathering and erosion (e.g. [Link One](#) or [Link Two](#)) Ask students if they've ever seen the effects of deposition or erosion first hand. Students might respond that they've traveled to the Grand Canyon or that they've seen Mount St. Helens.

Discuss whether a canyon being carved and a volcanic explosion would be considered deposition or erosion. Tell students that these are large-scale examples, but that deposition and erosion frequently occur at much smaller scales. Ask students if they can think of any examples of small-scale weathering and erosion. Students may be able to identify the erosion caused by rain, or mounds of dirt carried by water and deposited against a sidewalk. Ask students if these smaller examples can be considered a problem, and if so, why.

Take students outside to look at the school's downspouts and examine measures that have been taken to help control constructive and destructive forces. Review the history of recent floods in Atlanta (2009, 2015 and 2017), and discuss the impact on both lives and property in the area.

Tell students that Mercedes-Benz Stadium uses a unique system to prevent destructive forces from damaging the surrounding ecosystem. Ask them to brainstorm ways to prevent erosion, deposition, and other destructive and constructive occurrences.

In Motion

While touring Mercedes-Benz Stadium, students should take notes of the ways in which designers mitigated damage to the local landscape and ecosystem. Many of these features will be outdoors. Some examples include the installation of a water reclamation cistern to prevent local flooding, landscaping to control erosion, and green spaces for parking and tailgating that create less runoff.

Post-Game

Upon returning to school, students will use their knowledge of how constructive and destructive processes cause changes in the Earth's surface to explore solutions to resulting local problems.

Working as a group, students will design a structure that has features to help prevent destructive forces from damaging either the structure or the surrounding area. Students may focus on damage from rain, floods and hurricanes – or may design a more advanced structure meant to withstand seismic activities or tornadoes.

Students may use computers to research options for water recapture or technologies that allow buildings to remain standing after earthquakes to incorporate into their design.

Up Your Game

Have students use building materials such as wood, metal, sheetrock and/or plastic to construct their design, and then find a way to simulate the destructive or constructive force to test out how it works. For example, students might place their "flood resistant" structure in a tub of water to see how the features hold up.

Fun Fact

Mercedes-Benz Stadium has the capacity to store more than two-million gallons of storm water on site, helping to prevent flooding in the neighborhood.

Fast Break

Have students examine the landscaping outside the stadium. Do you see any evidence of constructive or destructive forces? How has the stadium used forces that could have been damaging for good instead of bad?

Beyond the Game

Look around your community. Can you find damage from destructive forces? Come up with a plan to either fix the damage or to prevent it from occurring again. Present your ideas to the city council and gather volunteers to help make it happen. Bonus if you can fix it using recycled materials!



Career Connection

Water Manager - Plans, develops, distributes and manages the optimum use of water resources. This career requires a bachelor's degree

in geology, engineering (civil, environmental, chemical or petroleum), business or hydrology.

Environmental, Health and Safety Coordinator - Manages company compliance with environmental standards and regulations. For this career, a bachelor's degree in environmental sciences or a similar program is needed.

Water Quality Technician - Tests and monitors water supplies for safety. This job usually requires a bachelor's degree, but a two-year degree that includes laboratory training may also be accepted by employers.

PUT A LID ON IT

STEM, Art History

Standards: MGSE5.NF.1; MGSE5.NF.2; MGSE5.NF.3; MGSE5.NF.4; MGSE5.NF.5; MGSE5.NF.6; MGSE5.NF.7; MGSE5.G.1; MGSE5.G.2; MGSE5.G.3; VA5.CN.1.a

Game Plan

In this experience, students will:

- consider the process designers used in creating the unique stadium roof,
- use a coordinate plane to design their own unique roof, doorway or window, and
- understand how fractions can help to divide a space into equal parts.

Driving Question

How can plotting points on a plane help designers to create a structure that is unique, functional and pleasing to the eye?

Materials Needed

Pencil, sketchbook or notebook, graph paper

Pre-Game

Show students a picture of the oculus at the Pantheon in Rome. (Visit this [link](#) for facts about the Pantheon along with images of the oculus.) Ask students to brainstorm ideas to cover the oculus on stormy days. To get them thinking creatively, remind them that the Pantheon itself is considered a work of art and the cover should be up-to-par with the rest of the building.

Discuss ideas as a class. Take one of the ideas and sketch it on the board. Ask students if it would be easier to move the cover as a single piece or if it should be divided into multiple pieces. Challenge students to decide how to partition the new cover so it is easier for one person to move the individual pieces rather than moving it as a single unit.

Next, have students sketch their individual design solution, including partitions, on graph paper. Ask them to pay attention to the points where the angles fall and write their plot points off to the side. Next, ask students to select a partner and, using coordinate points, direct their partner to draw their design without showing them their paper. Can their partner recreate their design by solely using their coordinate points?

Show students a side-by-side photo of the [oculus](#) and the [roof of the Mercedes-Benz Stadium](#). Explain to them that the roof of the stadium was actually modeled after the Pantheon. Discuss how designers came up with, plotted out, and tested the idea before using the 21,000 tons of steel to build it.

In Motion

Students will pay particular attention to the design of the stadium roof. They will observe it in the closed position and, if possible, watch as it opens. Note whether the pieces seem to be the same size. Students should ask the tour guide for measurements for each of the eight pieces that make up the roof and write them down.

Post-Game

Students will use their knowledge of coordinate planes and the ideas gleaned from observing the stadium roof to create their own uniquely shaped opening. Students will decide what shape their opening will be and how to segment it. They will then use graph paper to chart points for these shapes to show the opening in both open and closed positions. Students should note the grid coordinates of each of the points and angles in their creation.

Up Your Game

The use of some angles and fractions increases the strength of structures. Extend students' learning by using the coordinate plane to design different bridges from materials such as wax paper, glue and toothpicks. Have them test the strength of different geometric shapes. Which shapes can withstand the most pressure?

Fun Fact

The angular, wing-like exterior sections on Mercedes-Benz Stadium are a reference to the Atlanta Falcons, one of the stadium's two home teams.

Fast Break

Direct students' attention to the way the stadium seats are organized. Is it possible to divide the seating area into equal sections? Why or why not? Look at the way that seats are lettered and numbered. How is this similar to and different from the way a coordinate grid works?

Beyond the Game

Dividing a whole into smaller, equal shapes is good for more than just roofs and architecture. Equal distribution of resources such as food can ensure that there is enough for everyone. Visit your local soup kitchen or food bank to discover how many people

they serve each day. Look at the amount of food resources they have and use fractions to discover what they are able to provide to each person. Do some quick research on [USDA.gov](#) to determine if that amount is enough to sustain the community members who rely on those provisions. If not, come up with ways to collect food donations until the ratio of food/person is correct.



Career Connection

Architect - Creates designs for houses, commercial buildings and a variety of other structures. A bachelor's degree as well as a special

license are required to work as an architect.

Engineer - Conceives, designs, develops and tests various products and structures. They can work in a variety of areas, including electrical, mechanical and structural engineering. This career requires a bachelor's degree, and in some cases, engineers may pursue master's and doctoral degrees.

Cook - Prepares workstations with all needed ingredients and tools used for cooking. Chops, peels, cuts and preps different ingredients used to cook recipes. This job requires a high school diploma and hands-on training. To advance to a chef, often requires attending a culinary school.

Nutritionist - Provides guidance to clients on food and nutrition, and how both impact health. In addition to a bachelor's degree, a certificate is required for a nutritionist to work in some medical facilities.

Artist - Creates works of art that may be displayed in a variety of settings, including galleries, museums, public spaces and private homes. A career in the arts requires a high school diploma and specific training (possibly through a college degree) in the artist's preferred medium(s), such as painting, drawing, photography, sculpture or ceramics.

FROM TRASH TO TREASURE

Art & Design

Standards: VA5.CR.1.a,b;
VA5.CR.2.a,d; VA5.CR.3.a,c,e;
VA5.CR.4.b; VA5.Pr.1.a,b;
VA5.RE.1.b,d; VA5.CN.1.a,c,d;
VA5.CN.2.a

Game Plan

In this experience, students will:

- learn about art made from unique materials,
- learn about an artist from the art collection at Mercedes-Benz Stadium that uses unique materials in their artwork,
- discuss the importance of activist art, and
- collaborate to create a found-object work of art based upon a positive message.

Driving Question

How can I use found objects to create a work of art that carries a positive message?

Materials Needed

Recycled/reusable materials (In order to have a supply ready for the students to choose from, start collecting early), sketchbook, pencil

Pre-Game

Start a discussion around art made from recycled or reused materials. Explain to students that this type of art is often created to bring awareness to the importance of recycling and limiting the amount of waste that we create. Share [this](#) article that highlights artists working with recycled and reused materials. Discuss with your students what they see in each of the pieces. How does this type of art bring awareness of an issue to the viewer?

In addition to talking about the meaning behind the pieces, be sure to have the students discuss where they see the elements and principles of design present. How have the artists used these principles? Pick two or three of the pieces to focus on and have students take turns discussing how the artists have successfully used their chosen medium as well as the elements and principles.

Now, show the students “One Voice” by artist Nari Ward.

In his work, he often uses upcycled objects found in his New York City neighborhood. This piece is made with shoelaces that were collected from the Atlanta Falcons and high school football teams. Discuss with students the symbolism of the shoelaces and how knowing this information changes the meaning of the work for them.

Explain to the students that, after their field trip to the stadium, they will create a piece of art using recycled/reused materials. Instruct them to



pay close attention to the art at the stadium, and what materials the artists have used. Also, as they make their way through the stadium, have them think of how they could create a piece for the stadium using recycled materials.

In Motion

Remind the students to pay attention to the different materials that the artists used in the pieces throughout the stadium. Tell them to create sketches and write notes of some of their favorites. Also, tell them to record any ideas that they have for their projects once back at school.

Post-Game

Have the students bring out their sketches and notes from the stadium tour. Ask which pieces they chose to sketch and why. Were there any interesting materials that you noticed in the art works?

For this project, the students can work in small groups or alone. They will create a piece of art using recycled and/or reused materials. Their project should focus on an issue for which they would like to increase viewer awareness.

As the students brainstorm ideas, remind them of the artists that you looked at prior to going to the stadium. Have them think about these questions:

- What environmental issue do I feel strongly about?
- What message do I want the viewer to take away from my project?
- What colors would be important in my project? Why?
- What materials could I use to create my project?
- How would I convince the stadium to buy my art to display?

For the last part of the project, students will create a mock proposal they could submit to the stadium asking that their piece be chosen for display. The artists that they saw on the tour went through a similar process, as do most artists when responding to a call for projects. Their proposal should address the following:

- What issue does my project address?
- Why is there a need to bring awareness to this issue?
- What makes my artwork unique?
- Why would it be a good fit for the stadium?

When they are finished, have students display their pieces throughout the school to raise awareness among their peers and teachers of their chosen topic.

Up Your Game

Talk with your principal or school administrator about creating a permanent outdoor piece created from recycled or reusable materials. Have your students decide upon a theme, and invite the school to submit ideas for an artwork based on that theme. Allow the students to select a winner, and then collect the needed materials and create the work as a class.

Fun Fact

Being sustainable and environmentally friendly was important to the designers of Mercedes-Benz Stadium. And it's earned the stadium the title of the most sustainable sports facility in the world! To see the many ways that they focused on this important aspect of the stadium's design, show your students [this](#) webpage.

Beyond the Game

Using inspiration from the work of Nari Ward that you discussed in class, look around your neighborhood for up-cycled or recycled objects you could use in a piece of art. Collaborate with some of your friends and neighbors to create an artwork that is reflective of the unique beauty of your neighborhood.



Career Connection

Conservator - Helps to preserve and repair artworks, buildings and other items of cultural or environmental interest. This job requires a master's degree in art conservation and a multi-year fellowship.

Activist Artist - Uses art to increase awareness of an important social issue. Their work comes with a powerful message that forces viewers to consider issues from new perspectives, and hopefully creates positive change.

BUILDING SUSTAINABILITY STEM

Standards: S6E3.b; S6E5.e; S6E6.b

Game Plan

In this experience, students will:

- examine and explore building and design methods that are used to increase sustainability, and
- analyze the effects of construction decisions on the global and local community.

Driving Question

How do sustainability efforts benefit areas both large and small?

Materials Needed

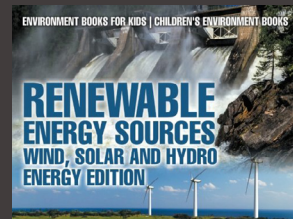
Notebook, pencil/pen, technology to conduct research

Pre-Game



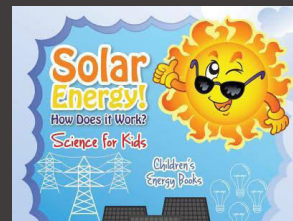
Literature Connection

There are a variety of nonfiction books about solar energy; check with your school or public library. Here are a few:



Renewable Energy Sources - Wind, Solar and Hydro Energy

This book describes what a renewable energy source is and how you can help care for the environment.



Solar Energy! How Does It Work?

This is a great book that teaches students what solar energy is, how we can harvest it, and ways that it can provide energy.



A HOT planet needs cool kids

This book helps readers understand the causes and effects of climate change and how people can take steps to stop or slow down these effects.

Discuss the natural resources and needs that all of humanity share. Ask students what resources and characteristics allow us to live on this planet. Responses might include clean air, food to eat, safe water to drink, a stable environment and shelter.

Show students images of pollution. There are many pictures online of plastic in the oceans, factories producing smog, litter piles and murky water. Try to focus on pollution issues in the United States, in places such as Flint, Mich., to reinforce that pollution is not just an issue in other countries. Ask students to explain where this pollution is coming from and whether or not the processes that create it are necessary.

Next, show students images of man-made erosion such as the 2018 California landslides, logged mountaintops and mining operations. Discuss what happens during erosion. Students should examine the photos, orally describe what has happened to the soil, and hypothesize the effect on local waterways and ecosystems.

Ask students where they think the energy to power the school building comes from. Discuss various energy sources such as coal, petroleum, hydroelectric, natural gas, wind and solar. Tell students that a resource is considered renewable if it can be replenished in less time than it takes to consume. Visit the Energy Information Administration [website](#) to further explore these energy sources, and classify them as renewable and nonrenewable. Create a chart of pros and cons of each source.

Lead students in a discussion about what energy sources are best for the planet, what can be done to reduce pollution, and methods to prevent further erosion and destruction of landscapes.

In Motion

While touring Mercedes-Benz Stadium, students will find out why the stadium is a leader in conservation. Students should make note of features such as LED lights, the solar panel deck, electric-car charging stations, zero-water urinals in the men's restrooms, use of natural light, recycling, and the water recapture and reuse system.

Post-Game

Students will use the information they gathered during their trip to the stadium and compare it to the features of their own campus building. Break students into groups; each group will focus on one of the following: water usage, energy or waste.

Students in the water-usage group will look at aspects such as toilet technology in student restrooms, water used for landscaping, and areas where fast-flowing water might cause issues with runoff and erosion.

Students in the energy group will examine the types of lights in the building, the number and quality of windows, and other components of energy usage such as thermostat settings.

Students in the waste group will look for evidence of recycling programs, access to information for students about what can be recycled, and the amount of waste produced by cafeteria products.

In each group, students will come up with proposals for how to improve the school's impact on the environment. Some methods students might suggest are using recyclable materials instead of Styrofoam or plastic in the cafeteria, transitioning to LED lighting or installing water cisterns to prevent runoff.

Up Your Game

Students will work together to design a home or school that uses green energy, reduces waste, conserves water and promotes sustainably sourced materials. Students can use graphic design software to plan their structure and research features such as gray-water reclamation systems to include in their design.

Fun Fact

The Mercedes-Benz Stadium design team selected transparent ETFE (Ethylene tetrafluoroethylene, a fluorine-based plastic) pillows to use in the roof because of its highly sustainable nature and the visual connectivity it creates.

Fast Break

The sun is a powerful energy source that is used at Mercedes-Benz Stadium. Have students look for the solar panels. How many panels does the stadium have? Ask the tour guide how many homes or games the solar panel deck can support.

Beyond the Game

Dividing a whole into smaller, equal shapes is good for more than just roofs and architecture. Equal distribution of resources such as food can ensure that there is enough for everyone. Visit your local soup kitchen or food bank to discover how many people they serve each day. Look at the amount of food resources they have and use fractions to discover what they are able to provide to each person. Do some quick research on USDA.gov to determine if that amount is enough to sustain the community members who rely on those provisions. If not, come up with ways to collect food donations until the ratio of food/person is correct.



Career Connection

Physicist - Studies how matter and energy interact in the physical universe. This career requires a bachelor's degree, and in some fields a master's or doctoral degree.

Materials Scientist - Researches and studies the structures and chemical properties of various natural and synthetic or composite materials, including metals, alloys, rubber, ceramics, semiconductors, polymers and glass. This job requires bachelor's and master's degrees.

Green Energy Scientist - Studies ways to harvest energy from natural resources such as wind, sun and water. While some positions only need a high school diploma and trade-school training, further advancement can require a bachelor's, master's or doctoral degree.

City Planner - Plans the construction, growth and development of a city or town. Can specialize in areas such as code enforcement, urban planning or environmental design, to name a few. This career requires a bachelor's degree and sometimes special certification.



RACING FOR RATIOS

Mathematics

Standards: MGSE6.RP.1; MGSE6.RP.2; MGSE6.RP.3

Game Plan

In this experience, students will:

- investigate and analyze players' speed statistics, compare them, and make accurate conclusions based on ratios;
- use mathematical tools such as a stopwatch to accurately measure and record data;
- articulate thoughts, ideas, and decisions effectively using a variety of forms and contexts; and
- demonstrate the ability to work well with others.

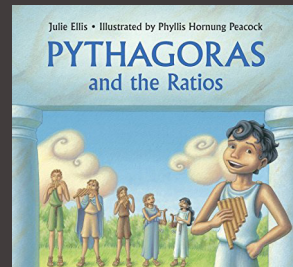
Driving Question

How do ratios help people make decisions about value?

Materials Needed

Paper, pencil, stopwatch or cell phone to record time, calculator, websites such as [this](#) one that provide NFL player stats, technology for research

Pre-Game



Literature Connection

Pythagoras and the Ratios: A Math Adventure is a fun read about how ratios can keep everyone in tune.

Pair students up (or put them in small groups) and provide a coin. Ask students to flip the coin 10 times and record whether it falls on heads or tails for each trial. When students have finished their trials, they should express their findings using a fraction. An example of a student response may be, "My coin landed on heads 8/10 times and my coin landed on tails 2/10 times." Make sure students reduce their fractions (if they haven't already).

Ask students to also show their data as a percentage by dividing the top number by the bottom number and moving the decimal to the right twice. Explain to students that their fractions can also be expressed as a ratio by comparing the number of times they experience one result to the number of times they experience the other result.

If the coin lands on heads four-fifths of the time and on tails one-fifth of the time the ratio would be expressed by saying, "The ratio of my coin landing on heads to landing on tails was 4 to 1." Students should then run multiple trials with their coins to practice expressing fractions, percentages and ratios.

In Motion

During the tour of the stadium, students will be allowed time on the field. While there, students will choose a partner to help them with their time trial. Students will use a stopwatch or cell phone app to time how fast they can run 10 yards while their partner records their time. The student will then switch places with their partner and use the same method to time and record. Students will then calculate their speed in terms of seconds per yard.

Next, partners will pass a ball back and forth 10 times and record the number of times they catch the ball and the number of times they miss. This will be expressed as a ratio of catches to misses.

Post-Game

Students and their partners will use various sports websites to research the fastest runners in the NFL this season. The students will analyze the recorded times for 10 different players' 100-meter runs and express them in terms of meters per second.

Next, students will research the number of times that 10 different players complete passes successfully versus the number of times they make incomplete passes. The partners should then express this data using a fraction, ratio and percentage.

Students will express their findings mathematically by graphing the speeds of the players on one graph and the percentages of complete versus incomplete passes on another graph. Using these statistics and ratios, each pair will determine which two players they would pick for a team.

Up Your Game

Use the data you and your partner collected while at Mercedes-Benz Stadium to rank yourself against other members of the class. Create a graph of your classmates' speeds, then create a double bar graph to show the number of catches and misses per "player." Compare your catch and miss ratio to that of the top player in the class.

Fun Fact

The scoreboard at Mercedes-Benz Stadium is 63,800 square feet and nearly three-times larger than the second largest NFL scoreboard.

Fast Break

Ratios are a vital part of Mercedes-Benz Stadium. During your tour of the stadium, have students pay close attention to how ratios are used. Do you think the builders used ratios? Are ratios vital to the restaurants at the stadium? How would things be different

if the builder or chef didn't know how to use ratios?

Beyond the Game

Ratios can be helpful when figuring out how much each unit in a grocery store costs. Students should simulate grocery shopping online and compare the prices per unit of popular brands versus their counterparts. For example, students can compare the price per ounce of their favorite name brand cereal against the price per ounce of the generic counterpart. Students should make a grocery list and compare the price per unit of the items on their list.



Career Connection

Statistician - Uses statistical methods to collect and analyze data to help solve real-world problems in business, engineering, healthcare or other fields. This career requires a bachelor's and sometimes a master's degree.

Coach - Trains, guides and teaches players how to play and excel in sports-related activities. This job requires a bachelor's degree and specialized training in their sport.

Professional Athlete - Competes individually or as part of a team in organized sports such as football, basketball, soccer, tennis, golf, hockey, baseball and more. Professional athletes are paid to compete for major league teams such as the Atlanta Falcons or Atlanta United. This career requires a high school diploma. Many athletes successfully compete in their sport in high school and/or college and dedicate themselves to extensive training.

DESIGN YOUR OWN LOGO

Art & Design

Standards: VA6.CR.1.a,b,d,e;
VA6.CR.2.a,c; VA6.CR.3.b,c;
VA6.CR.4.a,c; VA6.CR.5.a,c;
VA6.CR.6.d; VA6.PR.1.b;
VA6.RE.2.c

Game Plan

In this experience, students will:

- learn about the history of logo design,
- learn how the Atlanta Falcons and Atlanta United designed their logos,
- discuss the importance of a logo for a team, and
- create a logo for their own company.

Driving Question

How is a logo used in representing a sports team or company?

Materials Needed

Sketchbook, pencil

Pre-Game

Introduce your students to the Atlanta Falcons logo. Without giving them any background on the logo, ask what they notice about it. What do you see? What colors are used? Are there any symbols integrated into the design? What words come to mind when you look at it?

Now, tell them a bit about the history of the logo, and what it means. The current Falcons logo is an updated version of the one that was created in 2003. The original design was used from 1966-2002. You can find images and more about the history of the logo [here](#).

Atlanta United, Atlanta's soccer team, also has a strong presence in the Mercedes Benz Stadium. Their logo runs deep with meaning as every element depicts something special about the city and the team. For example, the five stripes on the logo represent what the team identified as the five pillars of character of the city of Atlanta: unity, determination, community, excellence and innovation. The logo for Atlanta United was designed by Adidas, and it took three months to complete. To read more about the logo, its conception and what each of the colors and symbols represent, visit this [link](#).

Now, talk to students about logos for different businesses they may know. You could start with asking them about their favorite restaurants, shoe brands, social media, etc. Choose one or two to discuss further and explore the following questions with them:

- How does this logo represent the organization or business?
- What kind of message does the logo carry?
- What kinds of symbols are included?
- What colors?
- Is it a strong design? Why or why not?
- Is there anything you would change about the design?

Have students imagine that they own their own business. What kind of business is it? Is it a social media platform? A clothing company? What about a restaurant? Encourage them to be creative with this – the sky's the limit! Instruct them to create some sketches of their business ideas and to keep them because they will need them after their tour of the stadium.

In Motion

Before you begin the tour, remind students of your previous discussion about logos, specifically the Atlanta Falcons and Atlanta United logos. Challenge them to count how many Atlanta Falcons and Atlanta United logos they see as they move through the stadium. Have them write the number down in their sketchbooks at the end of the day. Are the logos all the same? What types of things are the logos found on? Are they big or small? Also, in their sketchbooks, have them write down and/or draw other logos that they notice throughout their tour.

Post-Game

Once you're back in the classroom, have students tell you how many logos they counted during the tour. How many were the Atlanta Falcons' logo? How many were Atlanta United logos? What other logos did they see?

Have students break into pairs. Give them 10 minutes to answer the following questions:

- Why do you think there were so many logos of the Atlanta Falcons and Atlanta United in the stadium?
- Why is it important for a sports team to have a logo?
- What other logos did you see frequently in the stadium? Why would those be in a stadium?

Now, have the groups take turns sharing their answers with the class. Once they have finished, emphasize that logos are important because they:

- distinguish organizations from the competition
- represent loyalty
- can be placed almost anywhere
- attract new customers

Next, have students bring out their sketches of the business ideas they created before the tour. Tell them that they will now create a logo for their business. Ask them to think about all of the logos that they saw at Mercedes-Benz Stadium, as well as the ones that you discussed in class. If possible, have them visit [this](#) site for a list of questions to ask themselves as they create their logo.

Have them first draw their designs in their sketchbooks. Once they have finished their final design, they will recreate it on a separate sheet of paper using dry media and working as neatly as possible. Accompanying their logo designs should be a full description of their company and how their logo reflects their product, values and goals.

Up Your Game

Instead of drawing the final version of their logos, have the students create it online using software such as Adobe Photoshop or Illustrator, or a free tool such as LogoMaker. If you would like to have students use an app instead, here is a [link](#) to some of the better ones.

Fun Fact

The Atlanta Falcons were established by Rankin Smith in 1965. Rankin was 41 years old and paid the highest fee in NFL history (at the time) for the franchise.

Fast Break

As the students make their way through the stadium, have them write down or sketch the different logos that they see. When finished, have the group share what they found. Did anyone see a logo that no one else saw? Which one did you see the most? Were there logos that you did not recognize?

Give each of the students 10 minutes to think about a product that they would like to sell in the stadium. Once they have their product, instruct them to design a logo for that product. Have them draw it in their sketchbooks, along with the product they are selling. Give everyone a chance to present their products and logos to the group, and then have the class vote on the logo that they feel best fits the product being sold.

Beyond the Game

Have students create their own organization that is focused on performing at least one random act of kindness each day. The students should work together to decide upon a name for their group. After they have selected a name, they should design a logo for their group. Once they've finished, it's time to decide upon the goals of the organization. One of the goals should be for someone in the group to perform at least one random act of kindness every day. Each time an act is performed, it can be written down and placed in a jar. Once the jar is filled, the students themselves should be rewarded in some way.

**Career Connection**

Graphic Designer - Creates layouts for various design projects such as advertisements, magazines and reports. They often do their work using computer software.

This job may require a bachelor's degree in graphic design, but some graphic designers are self-taught.

Vinyl Installer - Works with graphic designers to cut and install vinyl artwork and lettering on vehicles, windows, interior and exterior walls, and other surfaces for customers. This job requires a high school diploma and specialized training.



DEPENDING ON EACH OTHER

STEM

Standards: S7L4.a; S7L4.b; S7L4.c

Game Plan

In this experience, students will:

- view the Mercedes-Benz Stadium as an ecosystem that uses sustainability to create a balanced environment,
- collect evidence while on the tour,
- collaborate with classmates to add to the ecosystem that has been established, and
- create a plan for implementing changes or advancements.

Driving Question

How do the components of Mercedes-Benz Stadium work together to form an example of an independent ecosystem?

Materials Needed

Notebook, pencil, digital cameras or other technology for taking pictures during the tour; display boards, other materials as needed

Pre-Game

Review ecosystems and talk about how the components interact and cycle with each other.

[Video about ecosystems](#)

[Video about abiotic and biotic components of an ecosystem](#)

In Motion

While students are on the Mercedes-Benz Stadium tour, have them use their existing knowledge to describe how the stadium is like an ecosystem. Have students work with a classmate to collect images of components that work together, taking note of all of the abiotic and biotic factors.

Post-Game

Students will work in teams to analyze the images and components that were found. Are there things that could be changed to help the stadium ecosystem be more successful? Are there components that would destroy the ecosystem if they were removed? Create a display of your findings.

Up Your Game

Using the data that was collected, create a new component to add to the Mercedes-Benz Stadium ecosystem. How would this component work seamlessly with the patterns that have already been established? How would this component make the stadium more sustainable?

Fun Fact

As you walk into the stadium, you can't miss the giant falcon statue. Standing more than 41 feet tall and weighing more than 36 tons, this massive metal statue was designed by Gábor Miklós Szőke, a Budapest-based artist who creates monumental structures around the world.

Fast Break

Have students create a collage of abiotic and biotic components that exist at Mercedes-Benz Stadium to depict a complete ecosystem.

Beyond the Game

Being part of a community, you have ecosystems that exist around you. Look at your community. Where do you see abiotic and biotic components missing? Where do you see some flourishing? How would you change your community to build a better ecosystem?



Career Connection

Environmental Designer - Designs buildings that are both functional and environmentally responsible. May work as an architect, urban planner

or landscape architect. This career requires bachelor's and master's degrees. Some professionals also have doctoral degrees in environmental design.

Restoration Ecology Specialist - Makes recommendations on how to improve and replenish ecosystems. For this career, a bachelor's degree in biology or a related field is required.

Air Quality Specialist - Uses special instruments to monitor the types and levels of pollutants in the air. This job requires a bachelor's degree in environmental science, environmental engineering or a closely related field.

SURVEY SAYS!

Mathematics

Standards: MGSE7.SP.1;
MGSE7.SP.2; MGSE7.EE.3

Game Plan

In this experience, students will:

- create a survey to determine what considerations patrons make when choosing food options at events,
- critically think about the results of the survey and draw inferences about how the population feels about the stadium foods based on their random sampling, and
- use their inferences to propose a change that will allow for patron preferences to be met.

Driving Question

What do patrons consider when choosing food at a Mercedes-Benz Stadium event?

Materials Needed

Pencil, computer, Google Survey, presentation materials

Pre-Game

Begin by asking the entire class what their favorite sport is and writing the results of the informal survey on the board. Create ratios for each response such as 5 out of 22 students prefer football, 1 out of 22 students prefers dance.

Ask students to hypothesize if the ratios would be the same if they surveyed all the 7th grade classes instead of just their own class. Leave these results on the board and ask only the girls about their favorite sport.

Create ratios for these numbers and compare them to the results from the entire class. Students might see a higher ratio of peers who prefer softball to baseball or other results inconsistent with the first survey.

Discuss what similarities students might see between the sample of only their class versus all 7th grade classes, as well as the differences they might see from surveying only girls versus the entire class.

Tell students that, when surveying their class versus the entirety of the 7th grade, they are creating a random sample. Including all members of the individual class in the survey ensures that responses should align with the responses of all 7th grade classes. If the sample is only taken from a specific group, the data collected will be skewed.

Examine the data from the survey of their class. Reexamine inferences that could be made about the entire 7th grade based on the collected data set. Discuss with the class what type of decisions could be made with the data collected. For example, the school board might decide to contribute more money to a football stadium if the majority of the students were interested in playing or watching football.

Discuss what surveys might provide beneficial data to administrators at Mercedes-Benz Stadium. Some surveys may examine choices a patron might make during an event at the stadium. Students may come up with ideas such as where to eat, where to sit, whether or not to tailgate, or myriad other options. In this activity, the specific interest focus will be on food options available at the stadium.

In Motion

While touring Mercedes-Benz Stadium, visit the various food vendors. Make notes about the price point of food options, their proximity to the different concourses, and what makes the food options unique (vegan, organic, fan-friendly pricing, basic or complex culinary experience, etc.).

Post-Game

Upon returning to the classroom, students will use the notes they took while at Mercedes-Benz Stadium to create a survey. Their survey will focus on what aspect patrons consider when making food choices at the stadium. Give students the option to base their surveys on the questions they considered while touring the stadium (price points, proximity, etc.), but encourage them to create additional questions written in their own words.

Instruct students to find a group of “patrons” to take your survey. Simulated patrons might include other teachers and students that accompanied them on the tour or staff members who have attended events at the stadium before.

Students should then look at their responses and draw inferences about the population as a whole. They should be able to infer how the general population feels based on the random sample they collected. If enough people are available students should take more than one sample.

An additional option is to instruct students to form groups and each one survey a random sample. Students will then determine how to best represent their findings mathematically. If multiple samples are taken, students can compare their ratios to the ratios of another group and try to deconstruct why large variances may have occurred.

Based on the final results of their survey, students will make recommendations to Mercedes-Benz Stadium for choosing food vendors in the future. For example, survey results might indicate a desire for more local or more traditional fare. Students will use their mathematical representation to create a report for administrators at Mercedes-Benz Stadium.

Up Your Game

Create a survey that students will issue to the community. Some good questions to include are:

- What do you like most about our community?
- What are some ways that we can improve our community?
- What are some services you feel our community could benefit from?

Ask students to take the survey home to collect responses in their neighborhoods. Gather the responses and present them at the next city council meeting.

Fun Fact

The designers of Mercedes-Benz Stadium listened to the public and created affordable options on the menu to fit their fans’ budgets.

Fast Break

After your tour, have students survey the people who were touring with you. What did they say was their favorite part of the tour? What can you infer about other people who come to the stadium? How can you represent your findings mathematically?

Beyond the Game

Statistics and probability are used in Mercedes-Benz Stadium and our communities to make decisions. Coaches use them to see who should play in the game or who might win. Insurance agents use them to figure out the best insurance plan for a family. Meteorologists use them to gain information about impending weather. Ask yourself how your family or community uses probability and statistics. How could you use surveys and statistics to identify special areas of need in your school? How could you use your findings to encourage school administrators to add programs, increase attendance or make other beneficial changes?



Career Connection

Mathematician - Works in a variety of fields and uses mathematical concepts such as algebra or geometry to solve real-world problems. This field requires a bachelor's degree and sometimes a master's degree.

Market Research Analyst - Gathers and analyzes data on consumer behavior and business competitors. This career requires a bachelor's degree in business or a related field.

Insurance Agent - Sells life, property, health, auto and other types of insurance policies and works with clients to choose a plan that is right for them. For this career, a high school diploma is required and, in many cases, a bachelor's degree.





LOCKER ROOM GENIUS

Art & Design

Standards: VA7.CR.1.a,b,c,e;
VA7.CR.3.b,c; VA7.CR.4.a,b,c;
VA7.CR.5.c; VA7.CR.6.b,d;
VA7.PR.1.a,b; VA7.CN.2,a

Game Plan

In this experience, students will:

- learn about the function and purpose of locker rooms,
- explore new innovations and designs in professional sports locker rooms,
- collaborate with a partner to create their own designs for a team locker room, and
- present their designs to the school athletic department.

Driving Question

How does the design of a locker room enhance a player's experience on game day?

Materials Needed

Sketchbook, pencil

Pre-Game

Discuss the following with your students:

- What is a locker room?
- What is it used for?
- What types of sports or activities require a locker room?
- What kinds of things do you find in a locker room?

Write their responses on the board where they can see them and refer back to them later. Now, show students some examples of locker rooms for various sports teams (do an online search for images of NBA, NFL or WNBA locker rooms).

Ask students to point out some of the things that they notice. Are there items in these locker rooms that you didn't talk about previously? If so, what are they? Why do you think you would need those things in a locker room?

Have students write down some of the things that they see in the locker room examples that they feel are the most important or interesting.

Here is a [link](#) to an article about contemporary locker rooms and some of the different aspects of design that go into creating them. Group students into pairs and have them read the article together. When they are finished, have students take turns sharing what they read and what they found to be some of the most interesting design features in the article.

Next, tell the students that they will get to see the locker rooms for both the Atlanta Falcons and Atlanta United on their tour. They need to take their sketchbooks with them so that they can take notes and create sketches of what they see in these spaces. They will refer back to these for their project after the tour, so make sure they do not lose them.

In Motion

Remind the students of what you discussed and learned about contemporary locker rooms in class. Tell them to pay close attention to all of the details that they see when they go into the Falcons and Atlanta United locker rooms. They should take a moment to create some sketches of what they see. Also, have them write down any interesting facts that they learn about how the locker rooms were designed and built. Encourage them to ask questions so that they can gather as much information as possible to take back to the classroom for their projects.

Post-Game

Now that you are back in the classroom, instruct students to take out their notes and sketches from the tour. What sorts of things did you notice about the locker rooms? What was your favorite part? Encourage them to share what they chose to sketch or write down.

Either in pairs, small groups or individually, the students will design their own locker room for their sport of choice. If possible, display some images of the locker room examples that you looked at previously, as well as some examples from Mercedes-Benz Stadium. Tell them to keep these questions in mind as they create their designs:

- What shape will your space be?
- What color scheme will you select?
- What materials will you use?
- What kinds of technology will be integrated?
- Will there be any art or inspirational quotes on the walls?
- How big will the individual lockers be?
- What kind of equipment will be stored there?

Their designs should be neat and in full color. Encourage them to use an aerial view of the

room, or one or two-point perspective. Once they have finished their drawings, they should include a full description of each of the elements that they included in their designs and explain why.

If possible, get the coaches, dance instructors and theater directors at your school involved! Let them know that you are having your students design a locker room, and you would like them to choose the top designs. Display the top designs in the school. Alternatively, have students present their designs to the class. Encourage the class to ask questions and offer constructive criticism to each of the presenters.

Up Your Game

Have the students create their locker room designs on a computer program or app. If your school has a subscription to Adobe Photoshop, that is a great one to use. If not, there are a variety of free apps such as Concepts (available for iOS) that students can use to create designs, experiment with color combinations and rearrange furniture.

Fun Fact

On game days, close to 4,000 pounds of equipment are brought into the Atlanta Falcons locker room.

Fast Break

As you make your way through the stadium, tell students to pay close attention to all of the details in each of the locker rooms. Have them create sketches of your favorite elements in each of them. When finished, have them think about how they would design a locker room if they had the chance. Have them make a list of all of the things that they would include and why. Are there things that you think should be added to the locker rooms in the stadium? If so, what are they? Have them make a quick sketch of their locker room idea and share it with their peers.

Beyond the Game

In many locker rooms there are things written on the wall that provide inspiration for the players to do their best both on and off the field. For example, in the locker room area for the Atlanta United, they have displayed their pillars of character which include Unity, Excellence, Community, Determination and Innovation. Displaying these words and their meanings on the walls serves as a reminder to the players to try their best, work as a team, and to serve as role models in their community.

As a class, take a trip through your school and pay attention to the things that you see displayed on the walls, ceiling and floors. Are there positive or inspirational messages displayed anywhere? If so, what are they?

When you get back to class, brainstorm some words or phrases that you could hang in the school to provide an inspiring message to your fellow students and teachers. Once you decide on a few, make some signs or posters with these messages written on them and hang them throughout the school. If possible, ask your principal if your class may paint a mural on one of the walls of the school displaying a positive message for the student body.



Career Connection

Carpenter - Works in the construction industry to build and create things from materials such as wood and steel. This career requires on-the-job training or a certificate from a technical or trade school.

Construction Worker - Builds a variety of structures, including office buildings, businesses, homes and schools. A high school diploma and on-the-job training are required for this career.

Furniture Designer - Creates simple or ornate furniture pieces for homes and businesses. Formal education isn't required in this field, but many professionals have a bachelor's degree in a fine arts discipline.



HOW FAST IS FAST?

STEM

Standards: S8P3.a; S8P3.b; S8P3.c; MGSE8.F.5

Game Plan

In this experience, students will:

- find their distance, speed and velocity;
- collaborate with a peer to analyze and interpret the data;
- create a graphical representation of their data;
- construct an explanation using Newton's Laws of Motion; and
- create and deliver an argument that supports their data.

Driving Question

How can you figure out your running speed without a speedometer or radar gun?

Materials Needed

Notebook, pencil, colored pencils, graph paper, stopwatch or cell phone to record time

Pre-Game

Watch this [video](#) about distance, speed/velocity and acceleration with your class. Make sure students understand distance, speed/velocity and acceleration, including the formulas to calculate them. Have students choose a partner and practice timing each other running using a stopwatch.

In Motion

During your tour students will have the opportunity to go onto the football field. While they are there, have them form their same partner teams and take turns running a 40-yard dash. Instruct them to record one another's time. Have them run a few times to see if they get faster.

Post-Game

Have the students determine their speed/velocity, and compare their data to that of their partner. Have the students make a graphical representation of their data as well as their partner's data. Plot distance on the y-axis and time on the x-axis. Make sure they use different colors to represent each partner's data, label their graph and make a key.

Have students analyze and interpret how their calculated speed/velocity values relate to the time it took them to run the 40-yard dash. Have each pair present their findings to the class.

Ask the class if Atlanta Falcon's wide receiver Taylor Gabriel can run the 40-yard dash in 4.2 seconds, at what speed is he running? Have them add his distance and time to their graph for comparison.

Now that they know their average speed in a 40-yard dash, have students write a paper that explains acceleration during a 40-yard dash using Newton's second law of motion. Is acceleration happening? Why or why not?

Up Your Game

In pairs, instruct students to make a plan of how they could become a faster runner. Remind them to consider all aspects of their daily lives. They can download a free running app like Runkeeper, which will track their progress, and allow them to set goals and join challenges.

Fun Fact

In 2013, Atlanta Falcons wide receiver Devin Hester [beat a cheetah in a foot race](#).

Fast Break

During your tour you will go onto the football field. While on the field, have students run a 40-yard dash and have a partner time their run. Each pair should record the amount of time it took them to run the distance. Have them determine their speed and compare it to everyone in their group. Next, have them create a graphical representation of the data. As a class, discuss ways to become a faster runner.

Beyond the Game

Have students create and implement a plan to help younger kids in their neighborhood or school become faster runners. Make sure to consider how diet connects to running. This [link](#) is a great resource on the types of foods that runners should include in their diets.

Students can also have a contest with their classmates to see who can make the biggest improvements in their 40-yard dash times. Tell them to work on their eating and training for a month. They can use the MyFitnessPal app to record what they eat and to track their calories and exercise. After a month, they can pair up again to time one another and check for improvements.



Career Connection

Sports Statistician - Tracks data for sports teams, including games won/lost, scores, individual team member goals, runs, speeds, accuracy,

etc. They are often interviewed on sports programs and networks as experts about their team or sport. Requirements for this career include a bachelor's degree in mathematics and on-the-job training.

Personal Trainer - Works one-on-one with clients to develop and implement a fitness plan. This career requires a high school diploma and special certification.

CHEAP EATS

STEM

Standards: MGSE8.EE.5;
MGSE8.F.2; MGSE8.F.3, S8P2.c

Game Plan

In this experience, students will:

- graph proportional relationships,
- determine the equation of a line,
- interpret the unit rate as the slope,
- compare properties of two functions,
- compare the value of the fan-first food to another stadium's food, and
- determine what type of energy food starts out as and what type of energy it transforms into when eaten.

Driving Question

Is it possible to buy multiple food items at an NFL game for under \$20?

Materials Needed

Notebook, pencil, colored pencils, graph paper, technology for research

Pre-Game

With your students, investigate the [food options](#) at Mercedes-Benz Stadium. Discuss with your class what a proportional relationship is and how to find it. Make sure students know how to determine the equation of a line.

Discuss with your class what the slope of a line is and how it relates to the equation of a line, and make sure they know how to graph a linear equation. Also, ensure they can identify different types of energy and energy transformations.

In Motion

When the tour arrives at the 100 Yard Club, have students make note of the menu items and their prices. Instruct them to inquire about fan-first pricing and why Mercedes-Benz Stadium offers it. Have them take notes about what they learn.

Post-Game

Back in the classroom, have students select a different stadium, look up their menu online and find the price of a hotdog. Students should compare their prices to the fan-first food prices. Now, tell them to create a function rule for the price of hotdogs for both stadiums.

Next, have students create a graph to compare the price of hotdogs at the two stadiums. Remind them to label their graph, use different colors for each line and make a key. Discuss with the class why they think Mercedes-Benz Stadium decided to charge so little for the hot dogs.

Using the technology available to them, have students make a slideshow to explain energy transfer when eating hot dogs. In the slideshow, students should:

- include five different types of energy,
- identify the type of energy the food starts as,
- show what type of energy the food turns into for our bodies to function, and
- explain the energy transformation that takes place when food is eaten.

Up Your Game

Tell the class to find at least three stadiums that sell hotdogs and compare prices. Next, create a graph that reflects the differences. Break the students into groups of three or four, and have them create a video based on fan-first pricing using the data from their graphs as their evidence of the amazing deal that they are getting at Mercedes-Benz Stadium.

Encourage them to have fun and use their creativity. When all of the videos are complete, allow their peers from other classes to vote on their favorite.

Fun Fact

At Mercedes-Benz Stadium, \$20 can buy you two hot dogs, a cheeseburger, two waffle fries and two Cokes (with unlimited refills). The best part? You'll get change back. What a deal!

Fast Break

When you get to the 100 Yard Club, have the class make note of the menu items and prices. Ask about fan-first. Why does Mercedes-Benz Stadium offer this pricing? Have them take notes about what they learn. While you are on the field, have students select another stadium, look up their menu online and find the price of a hotdog. Next, have them compare their prices to the fan-first food prices. Tell them to create a function

rule for the price of hotdogs for both stadiums, and draw a graph to compare the price of hotdogs at the two stadiums. Tell them to be sure to label their graph, use different colors for each line and make a key.

Beyond the Game

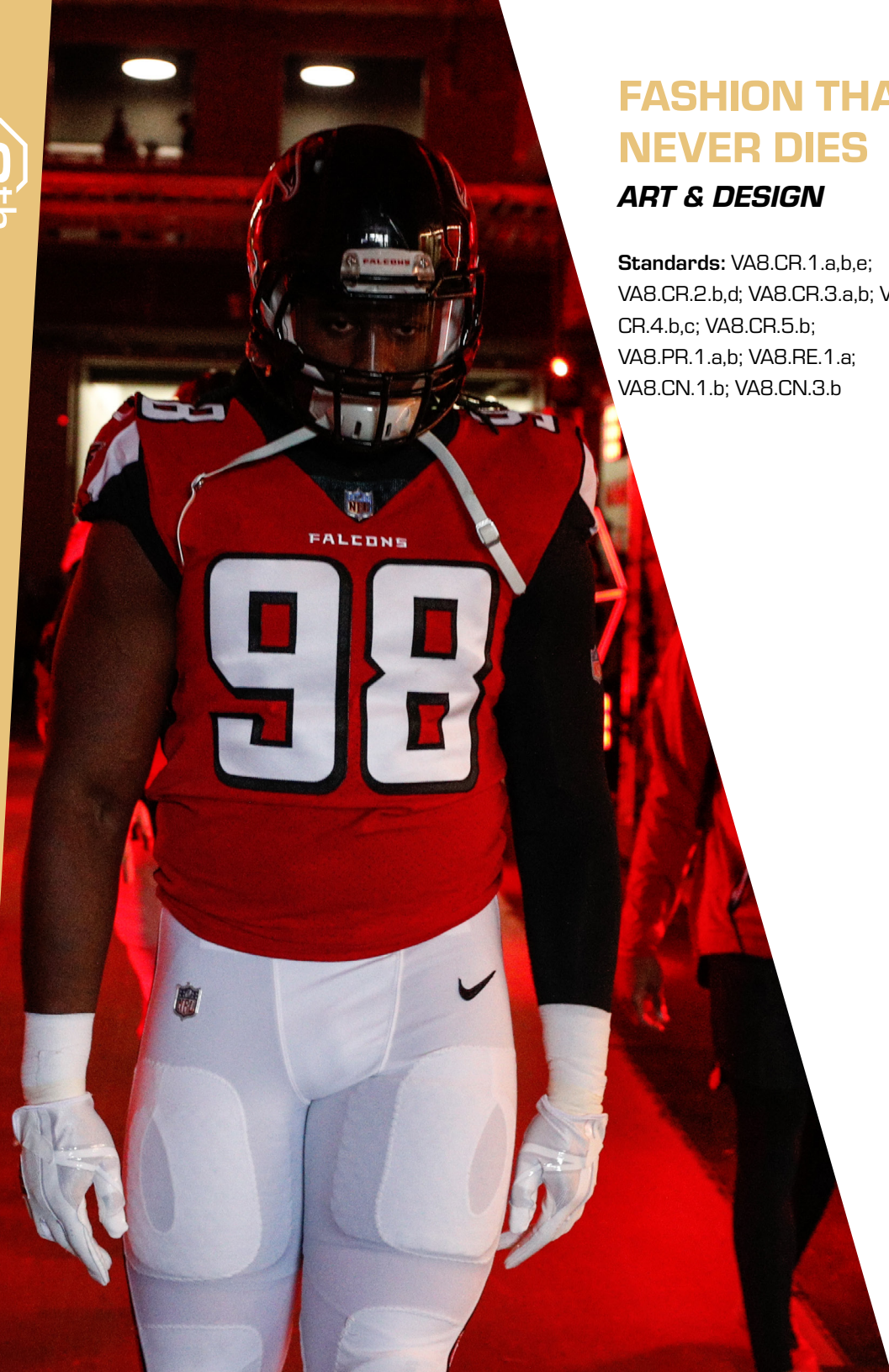
It is estimated that the United States has more food that reaches landfills and incinerators than any other material in our trash. Work with your school to take the [Food Recovery Challenge](#).



Career Connection

Budget Analyst - Helps public and private institutions organize their finances and monitor spending to ensure it is within budget. This career requires a bachelor's degree in finance or accounting.

Financial Manager - Responsible for the financial health of an organization, including reviewing financial reports and monitoring accounts. Also looks for ways to improve a company's profitability and identify new business opportunities. This career requires a bachelor's degree in finance.



FASHION THAT NEVER DIES

ART & DESIGN

Standards: VA8.CR.1.a,b,e; VA8.CR.2.b,d; VA8.CR.3.a,b; VA8.CR.4.b,c; VA8.CR.5.b; VA8.PR.1.a,b; VA8.RE.1.a; VA8.CN.1.b; VA8.CN.3.b

Game Plan

In this experience, students will:

- learn about green/sustainable fashion,
- examine various examples of clothes made from recycled materials,
- learn and explore why Mercedes-Benz Stadium is the most sustainable stadium in the world, and
- create their own item(s) of clothing made from recycled materials.

Driving Question

How can I use recycled materials to promote sustainability in art?

Materials Needed

Sketchbook/notebook, pencil, recycled materials

Pre-Game

Talk with your students about recycling. Why is this important? What is sustainability? Why is this something that people should be aware of?

Now, talk with students about Mercedes-Benz Stadium and their focus on sustainability. You can visit this [link](#) to learn about some of the many ways that they kept sustainability at the forefront of their design process. What are some of the ways that they are working to eliminate waste? How are they working to conserve water? Why are these efforts important?

Now, introduce students to the trend of trashion fashion. This is a movement in art where people of all ages create interesting, functional items of clothing completely from recycled materials. This [link](#) will take you to a short video of a trashion fashion show at Bates College in Maine. Additionally, do an online search for “trashion fashion” to find hundreds of additional examples. Choose a few of your favorites to show students. Try to create a mix of introductory level to more challenging examples. How are

these clothing designs creating an awareness of ecological issues?

Finally, tell students that after the stadium tour they will create an item of clothing from recycled materials and have their own trashion fashion show. Instruct them to take their sketchbooks with them to Mercedes-Benz Stadium and pay close attention to all of the ways that they are combatting ecological issues within the stadium. Encourage them to create sketches and write down the various techniques used at the stadium.

In Motion

Remind students that they will be sketching and writing about the various ways that Mercedes-Benz Stadium works to tackle ecological issues. Are there other ways that they could be even more sustainable? If so, how? If you were to create a piece of recycled fashion for the stadium, what would it look like? What materials would you use?

Post-Game

Now it's time to put all you've learned about sustainability and trashion fashion to work! First, have students sketch their item(s) of clothing. Once they have a design, have them decide what materials to use. You could brainstorm as a class all of the different everyday items that could be used such as water bottles, toilet paper rolls, paper napkins, plastic dinnerware, etc.

Once they have created their sketch and gathered their supplies, it's time to start putting their fashion piece together. Tell them to experiment with different ways of attaching items together to determine the best technique.

The item(s) that they create must be wearable and made completely from recycled materials (other than the method of attaching the pieces together). When finished, students should create an artist statement about their recycled fashion.

Work with your colleagues and administrators to determine a date to host your trashion fashion show. During the event, give students the opportunity to talk about their designs, how they created it and what recycled materials were used. If possible, invite other classes to create items to bring awareness to the importance of recycling and sustainability.

Up Your Game

As a class, find an organization in your city that focuses on recycling and coordinate your trashion fashion show with them. Invite them to come and present at the show.

Fun Fact

Mercedes-Benz Stadium has the capacity to store more than two-million gallons of storm water on site, helping prevent flooding in neighboring areas.

Fast Break

Have the class pretend that they have 20 minutes to create an article of clothing out of recycled materials that you find in the stadium. What would you use? How would you hold it together? Make some quick sketches of your idea. If possible, create a mock-up of your item of clothing while at the stadium.

Beyond the Game

Hold an auction and sell your trashion fashion. Donate the money to an organization in your community that focuses on recycling/sustainability, or use the funds to further your school's efforts to be more sustainable.



Career Connection

Sorter (Recycling Plant) - Separates different types of recycled materials so they can be processed. There are no specific education requirements

for sorters, but they must be able to work on their feet for long periods of time and have excellent eyesight.

Material Recovery Facilities Manager - Oversees all of the operations at a recycling center. Many professionals in this field have master's degrees in business administration or industrial engineering.

Fashion Designer - Creates and executes clothing designs for various clients. This career typically requires a two or four-year degree along with extensive knowledge of textiles, fabrics and fashion trends.

HOW BIG IS YOUR FOOTPRINT?

ENVIRONMENTAL SCIENCE & ALGEBRA

Standards: SEV4.a, SEV4.b, SEV5.c, MGSE9-12.S.IC.4

Game Plan

In this experience, students will:

- learn what makes up an ecological footprint,
- determine their ecological footprint and compare their results with their peers,
- discover their daily impact on the world around them,
- collaborate with peers to determine ways to decrease their impact on the Earth, and
- design a plan to make their ecological footprint smaller.

Driving Question

How can I make my ecological footprint smaller?

Materials Needed

A way to record data, technology for online research, paper and/or graph paper, colored pencils, poster board or cardstock

Pre-Game

As a class, read about the sustainability efforts at Mercedes-Benz Stadium, and watch the [video](#) on their website. Next, watch this [video](#) to help students understand the concept of an ecological footprint.

Have students check their ecological footprint [here](#). Determine the class mean of the data and create a graphical representation. As a class, make a list of all the elements used to determine your footprints, and take this list with you to the stadium.

In Motion

Instruct the students to do the following while on the tour:

- Using your list, make a record of the things the stadium is doing to help the Earth.
- If Mercedes-Benz Stadium is doing things that are not on your list, record those as well.
- Write down anything you learn about how Mercedes-Benz Stadium is helping the community.

Post-Game

Back in the classroom, students should discuss with their classmates how Mercedes-Benz Stadium made its ecological footprint smaller, and ways that they can make their own ecological footprint smaller.

Now, instruct students to do the following exercise:

- Using the data from Mercedes-Benz Stadium, your ecological footprint and your class discussion, design a plan to make your ecological footprint smaller.
- Use the information you learned about Mercedes-Benz Stadium's sustainability practices to create a plan to help your community have a smaller ecological footprint.
- Create a poster explaining how people can make their ecological footprint smaller.

Up Your Game

An environmental engineer helps the environment and public health. Have students research what an environmental engineer does and write a paper explaining how a person working in this field could help their community.

Fun Fact

Mercedes-Benz Stadium uses 100 percent LED lighting. This makes the stadium brighter and uses 75 percent less energy than incandescent lighting.

Fast Break

Have students watch this [video](#) about their footprint and check their ecological footprint [here](#). Next, have them make a list of all the things Mercedes-Benz Stadium is doing to help the Earth. Have them design and implement a plan to make their ecological footprint smaller.

Beyond the Game

Brainstorm with students a plan to help their neighborhood or community make its ecological footprint smaller. Encourage them to refer to the data that they gathered during the stadium tour, as well as their conversations with their peers, when coming up with ideas. An example might be to have the class help the Earth by [adopting a country](#).



Career Connection

Ecologist - Studies the interrelationship between organisms and their environment. This career requires a bachelor's degree with coursework

in science, math and computer science.

Climatologist - Analyzes climate patterns to help citizens understand local climate conditions and to help them adapt to the surroundings. This job requires a bachelor's degree in climatology or a related field such as meteorology or atmospheric science.

Environmental Engineer - Works to develop solutions to environmental problems such as waste management and air pollution. Also supports improvements in recycling, public health and other environmental issues. This career requires a bachelor's degree.

Forest and Conservation Worker - Assists with a range of activities that help maintain and improve the quality of forests, public lands and private nurseries. This job requires a high school diploma and on-the-job training.

HERE COMES THE SUN ENVIRONMENTAL & EARTH SCIENCE

Standards: SEV3.a, SEV3.b,
SEV3.c, SEV3.d, SES5.f

Game Plan

In this experience, students will:

- analyze renewable and nonrenewable energy sources; choose a nonrenewable energy and determine a renewable energy replacement;
- develop arguments for replacing the energy and present them to the class;
- compare and contrast the human impact of energy types;
- construct an argument to discuss the risks and benefits of renewable and nonrenewable energy sources; and
- design and defend a sustainable energy plan.

Driving Question

Will we replace our nonrenewable energy sources before we run out?

Materials Needed

A way to record data, technology to conduct online research, paper, colored pencils, poster board or card-stock (additional materials needed for Up Your Game)

Pre-Game

Before your tour, have the class watch a series of videos to learn more about [solar energy](#), how solar energy is [stored](#) and about [nonrenewable energy](#). Next, share this [video](#) with students to find out how many solar panels are at Mercedes-Benz Stadium. As a class, discuss the risks and benefits of renewable and nonrenewable energy.

In Motion

While on the tour, instruct students to look for the solar panels at the stadium and find out how many there are at Mercedes-Benz Stadium. Make sure students take note of everything the stadium does to conserve and produce energy, and encourage them to ask questions if they need clarification. If they have access to a phone,

have students take a selfie with the various methods of energy conservation at Mercedes-Benz Stadium as the tour guide points them out.

Post-Game

Once back in the classroom, students should collaborate with a partner to create a poster that analyzes their energy findings and explains why Mercedes-Benz Stadium is taking specific actions to conserve energy.

Alternately, if they took selfies of portions of the stadium that practice energy conservation, have them create a digital presentation to analyze their energy findings and explain why the stadium is taking specific actions to conserve energy.

Students should collaborate with a partner to select a nonrenewable energy source and choose a renewable energy source to replace it. They must develop arguments for replacing the energy source. Have them present their argument to the class and be ready to defend it.

Have the class discuss the impact of the different energy types, and in groups, design a sustainable energy plan that they will present to the class.

Up Your Game

Have the students make their own [mini solar car](#) and have a solar car race.

Materials needed from the video: Solar cell from a cheap toy (cut the wire off), small motor with a pulley (from a hobby store), old toy cars, plastic gears, one (1) LEGO, ballpoint pen case, hot glue

Fun Fact

Mercedes-Benz Stadium generates enough solar energy in a year to power more than nine Atlanta Falcons games and 13 Atlanta United matches.

Fast Break

Have students conduct research on [solar energy](#) and how it's [stored](#). Next, have them watch this [video](#) on nonrenewable energy. During the tour, look for the solar panels at the stadium. Students should find out how many solar panels there are at Mercedes-Benz Stadium, and note the things the stadium does to conserve and produce energy. Discuss the risks and benefits of renewable and nonrenewable energy.

Beyond the Game

Students should research the energy providers in their area and determine which companies use renewable energy sources. Have them make a flyer of their findings and post it in their community.



Career Connection

Solar Engineer - Plans, designs and implements solar energy projects. This career requires a bachelor's degree in mechanical engineering or electrical engineering and advanced computer skills.

Solar Technician - Performs site surveys on upcoming projects, and prepares and completes required inspections. This job requires a high school diploma and on-the-job training.

Solar Panel Installer - Installs, inspects, maintains and repairs solar panel systems. This job requires a high school diploma and on-the-job training.

HOW LOW CAN YOU EAT? ENVIRONMENTAL SCIENCE

Standards: SEV1.a, SEV1.b, SEV4.c

Game Plan

In this experience, students will:

- create a graphical representation of the flow of energy and its components using trophic levels;
- explain how the first and second laws of thermodynamics relate to the food chain;
- classify stadium food by trophic levels and justify their classifications;
- decide which food will give them the most energy; and
- discuss how human population growth affects our food supply.

Driving Question

What foods should we eat and why?

Materials Needed

A way to record data, technology for online research, paper and/or graph paper, colored pencils, poster board or cardstock

Pre-Game

Have students rub their hands together briskly, then put their hands on their face. Did you notice an energy transfer? Have students discuss with a partner whether or not there was an energy transfer and the evidence they have to support their answer.

As a class, watch these videos about the [First Law of Thermodynamics](#) and the [Second Law of Thermodynamics](#).

Energy also flows through the food chain. Have students create a graphical representation of the flow of energy and its components, including the [trophic levels](#). Instruct them to work with a partner to create a presentation that explains how the first and second laws of thermodynamics relate to trophic levels. Have each pair present to the class.

In Motion

When you get to the stadium, visit Molly B's restaurant and have students look at the menu. Tell them to pick three menu items and make note of their ingredients and prices.

Post-Game

Instruct students to do the following:

- Classify Molly B's food by trophic levels.
- Explain why you classified the food the way you did.
- Decide which food will transfer the most energy to you.
- Create a poster of your data.

Allow the class a chance to review each of the posters and to leave feedback on Post-It notes. Encourage them to include at least one positive comment about each poster and to write their suggestions in a constructive manner. Next, discuss with your class how population growth affects our food supply.

Up Your Game

Have students create a menu that would be low on the food chain but still provide lots of energy. Encourage students to make these dishes for their families.

Fun Fact

Mercedes-Benz Stadium is helping the community by creating [West Nest](#), a concession stand in the stadium that is run by the culinary arts graduates from [Westside Works](#).

Fast Break

Have students choose three items from Molly B's menu. Using the ingredients, have them classify their selections by trophic level and then create a graphical representation of their findings.

Beyond the Game

Work with students to create a community garden to help their neighbors eat healthy and be environmentally friendly. Invite other classes to contribute to the garden as well. As a class, choose a food bank or local food kitchen where you can donate the food, or identify families within your school or community that could benefit from the garden.



Career Connection

Dietician - Provides advice and counseling about diet, food and nutrition to clients. This career requires a bachelor's degree and a professional license.

Chef - Prepares food, trains and manages kitchen staff, and orders food supplies. This job requires a high school diploma with on-the-job training and/or a degree from a culinary program.



SERIOUSLY SUSTAINABLE ENVIRONMENTAL SCIENCE & ALGEBRA

Standards: SEV5.a, SEV5.d,
MGSE9-12.S.IC.4

Game Plan

In this experience, students will:

- learn about sustainability,
- discover how they can be more sustainable,
- learn how their school uses resources,
- analyze their school's utility consumption, and
- develop an energy plan for the school.

Driving Question

What does sustainability mean to me?

Materials Needed

A way to record data, technology to conduct online research, paper and/or graph paper, colored pencils

Pre-Game

Discuss with your class the concept of sustainability. Make sure to talk about water, energy, transportation, food and waste. As a class, read about the sustainability practices at Mercedes-Benz Stadium and watch the video on their [website](#). Discuss what they found most interesting and why.

Next, students should pair up and estimate how much money their school spends on utilities per month. If possible, obtain a copy of the school's utility bill. How does the bill compare to your guess? Have students create a graphical representation of the data from the bill.

In Motion

While on the tour, instruct students to find out where the energy used at the stadium comes from. Tell them to make note of all the elements they see and hear about during the tour that are related to sustainability. While on the football field, have them compare their findings with a friend.

Post-Game

Once back in class, students should look around their school and find two areas where they believe they could

make their school more environmentally friendly. Have them create a plan to do so. Tell them to be sure to include ways to get student and teacher buy-in for their plan. Each student will then present their plan to the class, and answer any questions from their peers. Lastly, have each student write a paper that discusses the relationship between quality of life and our impact on the environment.

Up Your Game

Have students create and implement a plan to make their homes more sustainable. Encourage them to try and make a plan that will both save money and help the environment. For example, they might create a list that reads:

- Make sure all lights are turned off when not in use
- Separate recyclable and non-recyclable materials
- Make sure to turn the water off while brushing your teeth
- Use metal water bottles or reuse plastic ones

Tell them to share their plan with their family and to display it where everyone can see it. Better yet, make a game of it! If they witness a family member breaking one of the sustainability rules, have that person put a quarter in a jar. The money collected can be used to purchase a water filter for their faucet instead of buying bottled water or for another activity that supports sustainability.

Fun Fact

The energy that Mercedes-Benz Stadium produces flows onto the grid and serves all Georgia Power customers.

Fast Break

Read about the sustainability practices at Mercedes-Benz Stadium and watch the video on their website. Find out where the energy used at the stadium comes from. Have students make a list of five things they personally can do to help the environment and develop a plan to hold themselves accountable.

Beyond the Game

Encourage students to find ways they can help their school or neighborhood be more sustainable. This can be small things like picking up trash or encouraging the community to buy products that are good for the environment. Students could start a recycling service and, once a week, visit their neighbors to collect their recycling. If they don't have a recycling facility in their neighborhood, encourage them to ask the city to help identify local resources where they can take the items.



Career Connection

Ecotourism Guide - Takes tourists on experiences that foster an appreciation of the environment; the conservation of wildlife, plants and resources;

and increases sensitivity to host countries' political, environmental and social climate. This job requires a high school diploma and an understanding of sustainability and environmental practices.

Energy Manager - Evaluates energy use and designs energy programs that increase efficiency and reduce energy-related costs. This career often requires a bachelor's degree in engineering, although some professionals have degrees in architecture, mathematics or physical sciences.

THE WONDER OF WATER

ENVIRONMENTAL SCIENCE

Standards: SES6.c, SES6.d, SEV2.a, SEV4.a

Game Plan

In this experience, students will:

- demonstrate an understanding that the Earth is one interconnected system,
- analyze and interpret data that relates to changes in the Earth's climate, and
- explain how climate change affects humans and the water we have available on Earth.

Driving Question

How important is water to the human race?

Materials Needed

A way to record data, technology to conduct online research, paper, colored pencils, poster board or cardstock

Pre-Game

With your students watch this [video](#) to see how the Earth is interconnected as well as this [video](#) to learn about our water supply. Next, read about water conservation at Mercedes-Benz Stadium and watch the video on their [website](#). The class can also watch this [video](#) to learn more about climate change.

In Motion

While at the stadium, instruct students to ask what it means to be LEED Platinum certified. Find out why the LEED certification is important to Mercedes-Benz Stadium. Also have students ask about how Mercedes-Benz Stadium is helping our water supply.

Post-Game

Discuss with your class what Mercedes-Benz Stadium is doing to help our water supply. Have students create a poster that shows how humans depend on Earth's land and water resources. Students should then create a digital presentation about how climate change affects us and how we can fix it. Have them present their findings to the class and be prepared to defend them.

Next, divide the students into small groups. Have each group brainstorm inventive ways to recycle water and collaboratively build a model of a way they could recycle water at home.

Up Your Game

Have each student spend a day taking note of how much water they use, and write down each time they use water and how long it runs. In class, have them compare data from the entire class. Discuss ways they can conserve water at home. Vote on one as a class and have students sign a contract saying they'll commit to this practice of conserving water.

Fun Fact

Mercedes-Benz Stadium has a vault that can hold over two-million gallons of storm water. This helps prevent flooding in neighboring areas.

Fast Break

Have the class watch this [video](#) to see how the earth is interconnected. Next, share with them this [video](#) on the limits of our water supply and this [video](#) about climate change. Next, have students research the LEED certification and why it's important to Mercedes-Benz Stadium. They should also find out as much as they can about how Mercedes-Benz Stadium is helping our water supply. Discuss with students how humans depend on Earth's land and water resources.

Beyond the Game

Most people don't know that antibacterial soap is no more effective than regular soap and it kills good bacteria, too. The bacteria that are not killed by the antibacterial soap are becoming stronger. These are called superbugs. Superbugs are strains of bacteria that are resistant to several types of antibiotics. Find out why [antibacterial soap](#) is bad for our water supply. Students can help spread the word in their school and neighborhood by creating posters to help people understand the effects of using antibacterial soap.



Career Connection

Engineering Geologist - Advises private and public entities on the natural, environmental and geological threat in real-estate development.

This job requires a bachelor's degree with a strong background in math and science.

Urban and Regional Planner - Develops and designs plans for the use of land and physical environments in towns, cities and large metropolitan areas. This career requires a bachelor's degree and usually a master's degree.

FALCON 500

PHYSICS, ALGEBRA & FUNCTIONS

Standards: SP1.a, SP1.c, SP1.d,
MGSE9-12.F.IF.4,
MGSE9-12.F.IF.7a,
MGSE9-12.A.CED.1

Game Plan

In this experience, students will:

- learn the science behind throwing a football,
- have a field day at the stadium,
- collect data to calculate their average speed and distance,
- create a graphical representation of their data,
- compare and contrast their data, and
- form a hypothesis.

Driving Question

How do NFL players use physics on the field?

Materials Needed

One (1) football for the class, a way to record data, technology for online research, graph paper, stopwatch or app, colored pencils

Pre-Game

Make sure students understand how to calculate average speed. Divide them into pairs and have them practice timing each other hopping a specific distance using a stopwatch.

As a class, watch a [video](#) on vectors in football. Now, select a classmate to throw a football and a classmate to run. Have the first student throw the football to the runner as they are running parallel to each other like in the video. Discuss how the direction played a factor in throwing the ball.

Next, discuss the difference between scalar quantities (such as speed) and vector quantities (such as velocity), and why they are both important.

In Motion

When you get to the field, the students will choose a starting point and run the distance between two yard-lines (make a note of whether the distance is five, 10 or

more yards) while their partner times them. Have them record their distance and time data. Next, have students run the same distance backwards while their partner times them. Again, have them record their distance and time data. Now, have them bunny hop the distance between the yard lines while their partner times them and record their distance and time data. Lastly, have them somersault while their partner times them and record their distance and time data.

Post-Game

Have students create a graph of the data and plot distance on the y-axis and time on the x-axis. Instruct the students to use different colors for each line, label the graph and make a key. Next, they will compare and contrast their data with their partner's data, choose the best scores for each event and create a graph from that data. Once they have completed this, students should compare the data with the rest of the class.

As a class, create a graph on poster board that has the best time for each event, complete with a key for each graph. Now, create a distance of an unknown length in a space at the school. Have students bunny hop the distance, making sure they go the same speed as before. The students will use their bunny hop average speed that they calculated above and their new time to calculate their unknown distance. Once the students have finished, reveal the unknown distance. Discuss the results and have them formulate a hypothesis as to why their calculations were correct or incorrect.

Up Your Game

Before they calculate the unknown distance, have students try to extrapolate it from their graph. After extrapolating it from the graph, they should calculate it. With a partner, have students discuss which is a more accurate way of finding the unknown distance and why.

Fun Fact

Atlanta Falcons cornerback Robert Alford runs the 20-yard shuttle in 4.23 seconds and the 40-yard dash in 4.39 seconds. Compare his data to yours.

Fast Break

When you get to the field, choose a starting yard line. Have students run the distance between two yard-lines while a partner times them. Have them record their distance and time data. They will repeat the same activity while running backwards and record their data. When done, have them create a graph of their data, plotting distance on the y-axis and time on the x-axis. Make sure they use different colors for each line, label the graph and make a key.

Beyond the Game

Set up an afterschool flag football game and help younger kids learn to throw the football and play the game. Children will learn to work together and form relationships with others in the community. It's a great way to build a stronger community and get healthy at the same time!



Career Connection

Aerospace Engineer - Primarily designs aircraft, spacecraft, satellites and missiles. This career requires a minimum of a bachelor's degree.

Athletic Trainer - Provides emergency care and physical therapy to athletes recovering from injuries. Also instructs athletes on how to prevent injuries. This career requires a bachelor's degree and a special certification.

LIGHTS, CAMERA, MIX THOSE COLORS

PHYSICS & COMPUTER SCIENCE

Standards: SP4.e, BCS-CMW-6.d

Game Plan

In this experience, students will:

- investigate how digital light and images are created,
- learn about light waves,
- understand what RGB is and how it is used, and
- convert RGB to hexadecimal.

Driving Question

How can red, green and blue create any color?

Materials Needed

A way to record data, technology for online research, paper, highlighters (pink, blue and yellow)

Pre-Game

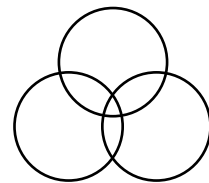
As a class, watch this [video](#) of the Mercedes-Benz Stadium's Halo board in action, and this one about [electromagnetic waves](#).

In Motion

While on the tour, tell the students to gather as much information as they can about the Halo display board. Encourage them to ask questions and to make detailed notes and sketches to reference later.

Post-Game

With your students, watch this video about [pixels](#) and experiment with [RGB](#). Using highlighters, have students create a graphic of how light mixes by creating circles like the diagram below. Have them color each circle a different color using pink, blue and yellow highlighters. This diagram represents primary subtractive colors. Notice that the areas where two colors overlap are red, blue, green (RBG).



In groups, have students come up with a hypothesis as to how the Halo board's lights work. Do they work by subtracting primary colors like your highlighters or adding them like the mixer did? Students should use notes from the tour to make their argument.

Up Your Game

Computers store information using binary numbers. Binary numbers consist of 0's and 1's. Binary is base 2. Binary numbers can easily be converted to hexadecimal (hex) numbers to make it easier for the computer to store them. Hexadecimal numbers are base 16. RGB is often converted to hex.

With your students, watch this [video](#) that explains converting from hex to decimal. To convert from decimal to hex you will divide instead of multiply.

Example: To convert the RGB color 81,6,143 to hex you will divide.

- $81/16 = 5$ remainder 1 so that is 51
- $6/16 = 0$ remainder 6 so that is 06
- $143/16 = 8$ remainder 15 so that is 8F (15 decimal = F in hex)
- So your answer is 51068F

The Atlanta Falcon red has an RGB value of 166,25,46. Convert Falcon red to hex.

Fun Fact

The Mercedes-Benz Stadium's Halo board is the world's largest screen at 63,800 square feet. That makes it larger than the Eiffel Tower!

Fast Break

Tell students to pay close attention to facts about the Halo board while touring the stadium. Then have them watch this [video](#) about pixels. Afterwards, they can experiment with [RGB](#).

Beyond the Game

Encourage students to change incandescent light bulbs in their homes to LED bulbs to save both energy and money. Also, tell students to look around the school and see what types of bulbs are used. Are they LED? If not, inquire about getting them replaced. Tell them to bring evidence of why LED lights are better and more efficient when they present their argument.



Career Connection

Computer Programmer - Creates instructions for computers to perform and follow by writing computer code. This career requires a bache-

lor's degree.

Graphic Designer - Creates layouts for various design projects such as advertisements, magazines and reports. Often works with computer software. This job may require a bachelor's degree in graphic design, but some graphic designers are self-taught.

Stage Lighting Technician - Responsible for the design and execution of the lighting plan on movie, theater and concert sets. This career requires a high school diploma.

RAISE THE ROOF

PHYSICS & GEOMETRY

Standards: SP2.a, SP2.e, MGSE9-12.G.SRT.2

Game Plan

In this experience, students will:

- collaborate with a partner to learn about Newton's third law of motion,
- create a structure from popsicle sticks or straws, and
- use proportions to solve problems.

Driving Question

Why doesn't the force of gravity cause roofs to fall to the ground?

Materials Needed

A way to record data, technology to conduct online research, paper, popsicle sticks or straws, glue

Pre-Game

Have a pair of students both select a non-breakable object of different weights. Tell them to hold their objects and let them go at the same time. As a class, discuss what happened and why. Next, have students watch this [video](#) to learn why the objects did what they did.

Before going on the stadium tour, have students make a foldable identifying Newton's three laws of motion. Use these [instructions to make a shutter fold](#).

In Motion

During the tour, students should ask approximately how many 747 airplanes it would take to match the weight of the roof and make a note of this. When they are on the football field, have them look up at the roof. Each petal of the roof weighs 500 tons. How much do they weigh together? Students should compare their answers with a friend and support their answers with evidence if they are different.

Post-Game

Discuss as a class why the force of gravity does not

make the roof fall like the non-breakable object did. Using the foldable, students should include one of Newton's laws in their discussion. Set up a proportion to find out how much a 747 airplane weighs and have the students compare answers. The students should then create a structure with popsicle sticks or straws that will hold a football and compare their designs with those of their classmates. Each student should choose their favorite and be able to explain why they believe that design is the best.

Up Your Game

Have students compete with the classmates to create the strongest structure from popsicle sticks or straws. Then create a YouTube channel that focuses on creating structures from unusual materials. Each week, post a new video using a different material. Challenge the class to make it a contest and see how many likes each video can get!

Fun Fact

The roof of Mercedes-Benz Stadium is made from 36-million pounds of steel.

Fast Break

During the tour, have students find out approximately how many 747 airplanes it would take to have the same weight as the roof and write down the answer. Then, have them set up a proportion to find out how much a 747 airplane weighs. Have them form a hypothesis about why the roof of Mercedes-Benz Stadium does not fall down.

Beyond the Game

Invite a local architect or engineer to your school. Have students share with them their findings from the stadium and the gravity-busting structures they designed. Students should ask the guest what they can do to take their structures up a notch. Be sure students thank them for the time and energy they put into your community.



Career Connection

Architect - Creates designs for houses, commercial buildings and a variety of other structures. A bachelor's degree as well as a special license are required to work as an architect.

Engineer - Applies the principles of science and mathematics to develop economical solutions to technical problems. May specialize in a variety of areas, such as structural, mechanical or petroleum engineering. This career requires a bachelor's degree.

IGNITING ART

ART & DESIGN

Standards: VAHSVA.CR.1.a,b,c;
VAHSVA.CR.3.a,b,c;
VAHSVA.CR.4.d,
VAHSVA.CR.6.a,b,c;
VAHSVA.RE.2.a,b,c;
VAHSVA.CN.1.e;
VAHSVA.CN.2.a,b,c,d;
VAHSVA.CN.3.a,b,c

Game Plan

In this experience, students will:

- learn about installation and interactive art,
- discuss the components required for art to be defined as an installation,
- discuss the work of some contemporary installation artists,
- explore interactive art at Mercedes-Benz Stadium, and
- collaborate to create an interactive art project.

Driving Question

How can interactive art change/enhance a visitor's experience of a space?

Materials Needed

Sketchbook, pencil

Pre-Game

Introduce students to installation and interactive art. Start by showing them some [examples](#) and ask them what they notice about the pieces. How is it different from art you see in everyday spaces? What about it is similar? Choose one or two of these artists to elaborate upon. How have these artists or their artwork challenged societal norms regarding what is or isn't art? Ask if any students have experienced an installation or interactive artwork. Is there a difference between the two?

Explain that an installation is an artwork that transforms a viewer's perception of a space. An interactive piece of art requires the viewer's involvement in some way for the art to achieve its purpose. An installation can be interactive, but it does not require interaction for it to alter the experience of the space.

Next, show students an image of the 100 Yard Club at Mercedes-Benz Stadium using this [link](#). The yard markers on the floor and the hash-mark lighting on the ceiling align with the markers on the playing field. A light will appear inside the club letting fans know where the ball is on the field in real time. Additionally, visitors are immersed in a space that is full of pillars displaying images of players and their bios, site-specific artwork on the walls, and Atlanta Falcons branding sprinkled throughout.

This will be one of the spaces that you will visit during your tour of the Mercedes-Benz Stadium. Instruct students to pay close attention to this space and to write down reasons why they think that it does or does not qualify as an installation or an interactive installation.

In Motion

Before entering the stadium, remind students of the definition of installation art, and to think about whether or not the 100 Yard Club would be considered as such. Also, encourage them to look closely around the stadium for other works that might be considered installation or interactive installation art. They must create a sketch of the work as well as record their evidence or reasoning for defining it as an installation.

Post-Game

Once back at the classroom, ask students if they found the 100 Yard Club to be an installation or an interactive installation. Why or why not? When you feel that the students have a good grasp on the definition of this type of art, invite them to create their own installation.

To do this, you can divide students into pairs or small groups. The size of their installations will depend on the space that you have available in the classroom or at your school. The first thing that the pairs/groups should do is create a series of sketches for their work. When creating their ideas, remind them to keep these questions in mind:

- What is the focus/theme of our piece?
- What materials will we need?
- What senses will the piece engage?
- Have we considered all elements of design?
- What color scheme will we use?
- How do we want the viewer to feel when they engage with the work?
- Will our piece be an interactive installation?

Once you have reviewed each of the proposed installations, have students begin the creation process. If the groups run into obstacles, invite the other students to work with them to problem solve. Along with their installations, the groups should create artist statements to accompany their work.

When all of the installations are complete, invite other classes/teachers to come and experience the works. At the end of each installation, have the students create comment cards for viewers to share thoughts on their experiences. If possible, invite the public to view the art as well.

Up Your Game

If there is a large empty space available in your school or community, inquire about using it to create a large-scale installation. Students should work as a large group to create this experience. Allow them to brainstorm together, and then assign various tasks to students so that everyone plays a role in the creation of the piece.

Fun Fact

On the walls of the 100 Yard Club you will find old seats from the Georgia Dome.

Fast Break

As students make their way through the 100 Yard Club, have them analyze the space with the definition of an art installation in mind. Does this space qualify as an installation? Why or why not? Have them sketch at least three ideas to make the space more interactive for fans. When finished, they can share their design ideas with the group.

Beyond the Game

Charge visitors a small fee to experience the installations that students create. Have students choose a nonprofit or charitable organization to donate their profits. Be sure to let visitors know that students are collecting the money for a specific cause that is important to them.



Career Connection

Industrial Painter - Applies paint, varnishes and other coatings to a variety of materials and surfaces. Works primarily in construction or manufacturing. This job requires a high school diploma and on-the-job training.

Installation Artist - Creates immersive artworks for large and small spaces. Training can be obtained through completion of bachelor's and master's degree programs in studio art. Some professionals are self-taught.

Art Installer - Packs, transports and installs artwork in various spaces including museums, galleries and office buildings. This career requires a high school diploma and extensive knowledge of studio art, art history and even chemistry.

PICK ME, PICK ME!

ART & DESIGN

Standards: VAHSVA.CR.1.a,b,c;
VAHSVA.CR.2;
VAHSVA.CR.3.a,b;
VAHSVA.CR.4.a;
VAHSVA.CR.5.a.;
VAHSVA.CR.6.a;
VAHSVA.PR.1.a;
VAHSVA.CN.1.c;
VAHSVA.CN.2.b,c;
VAHSVA.CN.3.b,c

Game Plan

In this experience, students will:

- learn about the selection process for the artwork at Mercedes-Benz Stadium,
- review examples of artist biographies and artist statements,
- create an artist biography and artist statement, and
- create a submission to send to Mercedes-Benz Stadium for possible display.

Driving Question

How can I create a successful artist proposal for a chance to display work at Mercedes-Benz Stadium?

Materials Needed

Materials will vary based on preferred media for the project.

Pre-Game

Discuss with students the process of creating an artist statement and proposal for submission to a gallery, museum or other space that exhibits art. What is involved? What type of information should you include in your submission? Is it the same for every space?

Explain to students that in order to apply for submission to display their art, they must first create a strong biography and artist statement.

An artist biography should include a few key points such as the medium an artist works in, any key themes in their work, any art-related education, etc. This [site](#) provides helpful tips and writing techniques to create a strong artist biography.

Now, talk with students about an artist statement. A statement focuses more on their body of work, whereas the biography is more about them as a person and their achievements to date. For some examples and good tips on writing an artist statement, visit this [site](#) with your students. It offers a wealth of information on how to go about writing an artist statement, including what to include, examples and resources.

Now, share with students the process that Mercedes-Benz Stadium went through in selecting the art that is displayed inside and outside of the stadium. They invited submissions from all over the world, and partnered with the Savannah College of Art and Design to select pieces and curate the space. They also polled fans to identify preferred colors and themes. The result was a proposal for art that focused on football, soccer, and/or the history of Atlanta and Georgia.

Instruct students to look for these themes as they move through the stadium and to read the information that is on the placards near each piece of art.

In Motion

While you are at the stadium, remind students to pay close attention to the artwork that is displayed. There are sculptures, murals, photography and mixed-media installations. Have them look for the themes that you discussed previously in class, and create sketches and take notes. Also, tell them to choose a few favorites and record how their work relates to one of the three themes.

Post-Game

Now that you are back in the classroom, it's time for the students to draft their own proposals for submission.

Discuss as a class the various ways that the artists in the stadium chose to represent the themes. Often, it was metaphorical, so encourage them to stretch their creativity and imaginations.

Give students access to the sites that you visited previously offering tips and suggestions to successfully create an artist biography and statement. For this project, they will be creating a submission to Mercedes-Benz Stadium for a chance to display their artwork inside the stadium.

For their submission they must:

- Create an artist biography
- Create an artist statement
- Create a piece of art that is dedicated to football, soccer, or the history of Atlanta and Georgia.

Once they have finished with everything, gather the proposals and send them to an administrator at the stadium. Additionally, hang the bios, statements and artworks in the school so that they can be viewed by the student body, teachers and visitors.

Up Your Game

Work with students to find actual calls for artist submissions. Each student should choose one for which to create a piece and send in a proposal.

Fun Fact

Of the 650 submissions that were received, only 54 local and international artists were chosen to display their art at Mercedes-Benz Stadium.

Fast Break

While touring Mercedes-Benz Stadium, have students pay close attention to the themes that they see in the art. What stands out most to you? Why do you think those themes were chosen? Have them make a quick sketch of a work that they think would fit within the themes displayed in the space. Back in the classroom, have them use their sketch to create the piece on a larger scale.

Beyond the Game

Many times, artists use their work to bring awareness to important issues in society. For example, artist Vibha Galhotra, whose work is on display at Mercedes-Benz Stadium, creates large-scale sculptures that address the effects of globalization and rapid environmental changes to the Earth.

Encourage students to look around their neighborhood and community. Are there issues that you feel need attention? Are there important phenomena occurring that are being overlooked?

Research and decide upon an issue that they feel is pressing and create an artwork to bring awareness to it.



Career Connection

Curator - Oversees programs, exhibitions and art collections in museums and galleries. Often designates where and how art should

be displayed in specific spaces. This career requires a bachelor's and often a master's degree in a specific art discipline or historical-artistic era.

Ghost Writer - Writes literary works or other texts that are officially credited to another person. This career requires a high school diploma and significant writing experience.

DESIGN YOUR OWN STADIUM

ART & DESIGN

Standards: VAHSVA.CR.1.a,b;
VAHSVA.CR.2.c,d,e;
VAHSVA.CR.3.a,c;
VAHSVA.CR.4.a,b;
VAHSVA.CR.5.a;
VAHSVA.CR.6.c;
PR.1.a; VAHSVA.CN.1.e;
VAHSVA.CN.2.a,b,c,d;
VAHSVA.CN.3.a,b

Game Plan

In this experience, students will:

- learn the process behind designing a large structure such as the Mercedes-Benz Stadium,
- understand the priorities behind the stadium design, and
- collaborate with a partner to create their own design for a stadium.

Driving Question

If I were to design my own stadium, what would be my top three design priorities?

Materials Needed

Sketchbook, pencil, large paper for a blueprint drawing, materials to create a 3D mockup of a stadium design

Pre-Game

Designing a structure as massive and complicated as the Mercedes-Benz Stadium is a big task, and it takes a large team for a successful execution. Before going in to detail regarding some of the steps involved, ask students the following questions:

- What are the steps involved in designing a structure such as the Mercedes-Benz Stadium?
- What are some of the careers involved in the design process?
- What are some important questions to ask when creating the design?
- How do you decide what the priorities of the design will be?
- Who is your target audience?
- How will this structure impact the community?

Once you have had a chance to discuss some of these questions, talk with students about Mercedes-Benz Stadium and the priorities for the design of this structure. When creating the stadium, it was very important for the team to focus on the following areas:

- Sustainability
- Community impact/involvement
- Accessibility for fans

Visit the Mercedes-Benz Stadium website with your students. As you navigate the site, discuss what features are highlighted on the website. What seems to be the most important? Is there evidence of their focus on sustainability, community impact and fan accessibility?

In addition to the website, show students some of the videos that are available on the Mercedes-Benz Stadium YouTube channel. Below are a few that focus on design processes and sustainability:

- [Ideas behind the design](#)
- [Sustainability](#)
- [Design process](#)

After watching the videos, have students break into pairs or small groups. For their project, they will be creating a design for their own stadium. As they tour Mercedes-Benz Stadium, have them create sketches and take notes of the things that they feel they would like to include in their stadium, as well as new concepts that they can imagine. Once they are back in the classroom, they will work with their groups on the design process.

In Motion

Remind students to take notes and create sketches of design elements that they would like to incorporate into their stadiums. Also, encourage them to ask questions relating to the design of the stadium, and think of ways that they would add to them or tweak them for their project.

Post-Game

Once you are back in the classroom, have students get into their pairs or groups and get to work! If possible, make the links to the Mercedes-Benz Stadium website and YouTube channels available for them to access. Remind them to think about the following as they create their designs:

- What are our top three design priorities?
- What materials will we use?
- What activities will be hosted in our stadium?

- Who will our target audience be?
- How can we benefit the community?
- Will we focus on sustainability?
- How will our design be different from other stadiums?
- Where will we draw inspiration?

At the completion of the project, they should have the following:

- A list of the three priorities that they focused on in their design
- Brainstorming sketches
- A final blueprint of their design that reflects the key components of the interior and exterior of the structure
- A written explanation of their three design priorities
- A 3D mockup of their design concept (if time permits)

Up Your Game

Have students create the final version of their designs on a computer using a design app. Here is a [link](#) to some of the top apps for student use. Once they have finished their designs, they should present them to their peers.

Fun Fact

The Mercedes-Benz Stadium is the first professional sports stadium in the United States to achieve LEED Platinum certification. Read more about that [here](#).

Fast Break

As the students move through the stadium, have them create sketches and take notes of their favorite design elements. Also, encourage them to think of one main focus that they would want their own stadium design to have. For example, for the Mercedes-Benz Stadium, sustainability was at the forefront of their design. Once you have finished the tour, instruct the students to make a quick sketch of their own stadium design, or at least one section of a design. Tell them to focus on the design element that they chose as the most important in their

sketch. When they are finished, they can share their ideas with their peers and discuss how they would integrate their focus into their designs.

Beyond the Game

Take a long and detailed look at the design of your school. Are there areas that could be improved upon regarding sustainability? As a class, visit this [site](#) that discusses ways to make schools and/or classrooms more sustainable. Are there things on the list that you could do in your own classroom?

Have students work together to create a poster reflecting the different steps they can take as a class and a school to create a more sustainable space. Display their work throughout the school, and record the progress that they make toward a goal of becoming more sustainable.



Career Connection

Architect - Creates designs for houses, commercial buildings and a variety of other structures. A bachelor's degree as well as a special license are required to

work as an architect.

Construction Worker - Builds the structures that an architect designs. This career requires a general equivalency diploma (GED) or high school diploma, as well as on-the-job training.

Environmental Scientist - Protects the Earth from man-made harm, including cleaning up pollution, advising policymakers and working with companies to reduce waste. This job requires a bachelor's degree in natural science, and in some cases a master's degree is needed to advance.

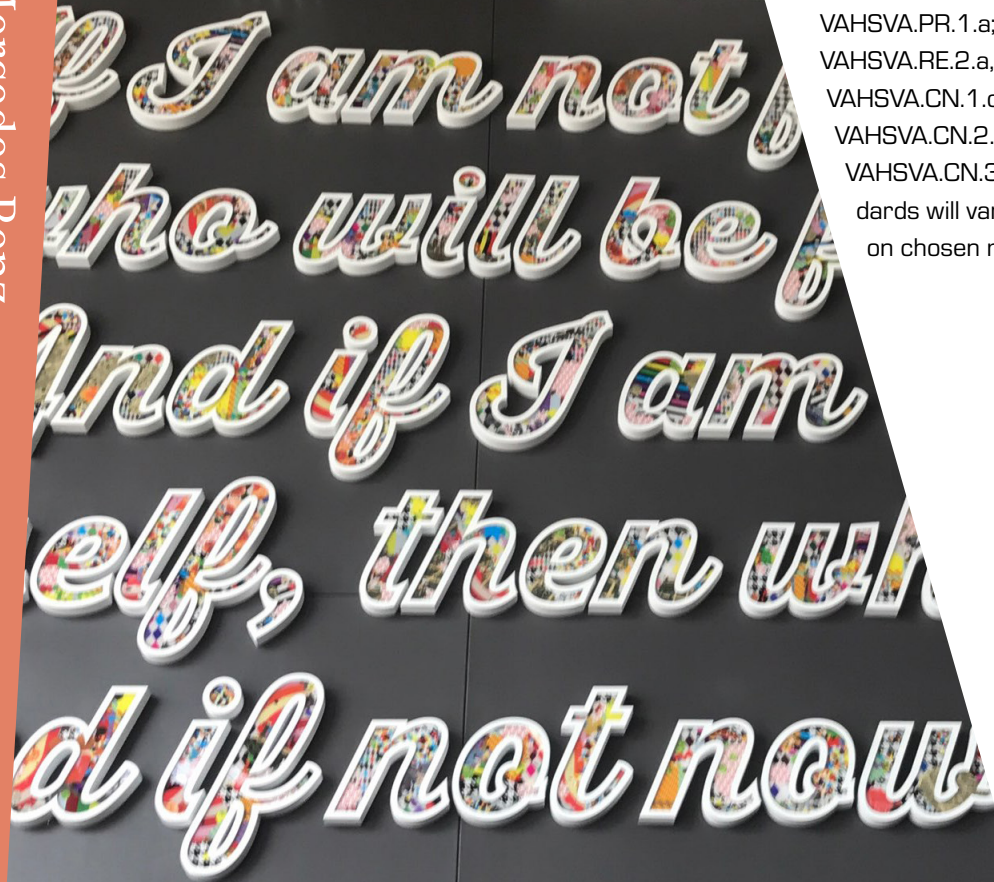


OHHHHH, I GET IT!

ART & DESIGN

Standards:

- VAHSVA.CR.1.a,b,c;
- VAHSVA.CR.2;
- VAHSVA.CR.3.b;
- VAHSVA.CR.4.a;
- VAHSVA.CR.6.a,b,c;
- VAHSVA.PR.1.a;
- VAHSVA.RE.2.a,b,c;
- VAHSVA.CN.1.c,d;
- VAHSVA.CN.2.a,b,c;
- VAHSVA.CN.3.b,c (Standards will vary depending on chosen medium)



Game Plan

In this experience, students will:

- discuss specific artists on display at Mercedes-Benz Stadium,
- identify ways that art can relate to the viewer,
- create a piece of art based upon a specific theme,
- write an artist statement, and
- present their work to their peers.

Driving Question

How can I create an artwork for a large space that is relatable to the masses?

Materials Needed

Examples of work from the following artists featured in Mercedes-Benz Stadium:

Jake Messing – “On the Line” (Mural of referees toppling one another located on Concourse 3)

Michael Porten – “Executive Function (After Hillel)” (Light-box sculpture located on Concourse 3)

Sketchbook, pencil, digital camera or cell phone to take pictures, additional materials for the project will vary based on preferred media

Pre-Game

Pose this question to your students: Is it necessary for art to be relatable to the viewer?

Allow students to give their explanations for why they believe it is or is not necessary. Encourage them to give examples in their response.

Talk with students about art in public spaces and personal pieces of art that hang in homes or private offices.

How are the two different? Should one be more focused on viewer relatability? Why or why not?

Now, discuss some of the art that they will see while on tour at Mercedes-Benz Stadium. Give a little background on how the pieces were chosen. The stadium put out an international call for submissions for work that could encompass the themes of football, soccer, and the history of Atlanta and Georgia in some way. Talk about how relatable these three themes are to the masses. Remind students that the stadium is not just a sports venue but hosts other events such as concerts, as well. Not everyone that comes to the stadium will be a sports fan or from Georgia. How would you create an artwork that is relatable to the masses while still staying true to those three themes?

Finally, show the students the following examples of work that they will see at the stadium. Instruct them to pay close attention to these pieces as you will be discussing them once they return to the classroom.

Jake Messing - “On the Line”



Michael Porten – “Executive Function (After Hillel)”



In addition to these pieces, tell students to sketch or take photos of any other artwork they would like to discuss as an example of a successful appeal to the masses.

In Motion

Remind students of the two images to which they are to pay close attention. Tell them to be sure to read the placards that accompany them. Also, make sure that they have a sketchbook or a way to take photos of other works that they want to discuss.

Post-Game

Back in the classroom, display the image of the work by Jake Messing. Ask students to discuss how they feel that this piece does, or does not, relate to most viewers. When

finished, do the same for the pieces by Michael Porten. After you have discussed these two artists’ works, open the discussion up for other examples that the students identified during the tour. Students should provide reasons as to why they do or do not think the works are successful in their relatability.

Now, it’s time for students to create their own work that they feel will relate to the masses. You can either use the themes that Mercedes-Benz Stadium selected or identify three of your own from which they may choose. Once the themes are selected, however, the students must create a piece of art based on one of them. Their goal is to make a piece based on the theme that is in some way relatable to most people.

Around the midpoint of the creation process, conduct an in-progress critique for students to get constructive feedback from their peers before completing their piece. When they have finished their art, they need to create an artist statement and highlight how they feel that their work is successful in relating to the masses.

Hang their work in the school along with the artists’ statements. Set up an area for people to leave comments on how they feel that the pieces were successful and adhered to the themes, while still being relatable to viewers who might not have a connection to the theme.

Up Your Game

Poll the student body and allow them to choose the three themes that the students must use in their work. Then, allow students and teachers to vote on which work they feel best adhered to one of the themes while still being relatable to everyone.

Fun Fact

The Mercedes-Benz Stadium measures two-million square feet. That’s a lot of space to fill with amazing art!

Fast Break

While on the tour at the stadium, ask the class to pay close attention to the pieces of art that they feel best adhere to the themes of football, soccer, and the history of Atlanta and Georgia. Why do you think those pieces are the most successful? Compare your choices to those of your friends or family.

Next, have students pick one of the themes and create a quick sketch of a work with which they think most viewers in the stadium would relate.

Beyond the Game

Poll your student body and teachers to decide on one word they feel best embodies your school. It might be easier to give some examples, but make sure they are all positive and are relatable for everyone. Once the word has been chosen, work with your class to create a mural in the school based on that word. The goal is for it to promote a positive and uplifting message to all who view it.



Career Connection

Mural Artist - Creates large-scale works on walls, either inside or outside. Working in this field can require everything from hands-on experience to a master's degree

in studio art, depending on the client. But a strong portfolio (examples of an artist's work) is a must to be successful.

Electrician - Installs wiring systems in factories, businesses and homes. This career requires significant training, usually through an apprenticeship program.



GEORGIA STANDARDS OF EXCELLENCE INDEX

3RD GRADE

Art and Design

VA3.CR.1

- Utilize multiple approaches to plan works of art incorporating imaginative ideas, universal themes, and symbolic images.
- Apply available resources, tools, and technologies to investigate personal ideas through the process of making works of art.
- Produce multiple prototypes in the planning stages for a work of art (e.g. sketches, 3D models).

VA3.CR.2

- Create works of art to express individual ideas, thoughts and feelings from memory, imagination and observation.
- Create works of art emphasizing multiple elements of art and/or principles of design.

VA3.CR.3

- Develop drawings and paintings with a variety of media (e.g. pencil, crayon, pastel, tempera, watercolor).
- Incorporate printmaking processes to create works of art (e.g. monoprints, collographs, Styrofoam prints editions).

VA3.CR.4.a (Create sculpture using a variety of methods (e.g., paper-mâché, cutting, folding, found objects)

VA3.CR.5 (Demonstrate an understanding of the safe and appropriate use of materials, tools, and equipment for a variety of artistic processes

VA3.PR.1

- Prepare works of art for exhibition with signature, title, and/or artist statement on finished work.

VA3.CN.1

- Recognize ways that artists are involved in communities and careers (e.g. architects, painters, photographers, interior designers, educators, museum educators).

VA3.RE.1

- Use a variety of strategies to critique, discuss and reflect on personal works of art and the work of peers.

Mathematics

MGSE3.G.1

Understand that shapes in different categories (e.g. rhombuses, rectangles, and others) may share attributes (e.g. having four sides), and that the shared attributes can define a larger category (e.g. quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

MGSE3.G.2

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

Science

S3L2

- Explore, research and communicate solutions, such as conservation of resources and recycling of materials, to protect plants and animals.

4TH GRADE

Art & Design

VA4.CR.1

- Utilize multiple approaches to plan works of art incorporating imaginative ideas, universal themes and symbolic images
- Apply available resources, tools and technologies to investigate personal ideas through the process of making works of art

VA4.CR.2

- Create works of art emphasizing multiple elements of art and/or principles of design

VA4.CR.3

- Apply drawing and painting techniques with a variety of media (e.g. pencil, crayon, pastel, charcoal, tempera, watercolor, acrylic).
- Apply understanding of multiple color schemes to create works of art (e.g. monochromatic, analogous, neutral, complementary).

VA4.RE.1

- Use a variety of strategies to critique, discuss, and reflect on personal works of art and the work of peers.

VA4.CN.2

- Describe and discuss various art-related careers and how design impacts daily life (e.g. art historian, art critic, curator, web designer, game designer, fine artist).

Mathematics

MGSE4.MD.1

- Express larger units in terms of smaller units within the same measurement system.

MGSE4.MD.2

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money, including

problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

MGSE4.MD.3

Apply the area and perimeter formulas for rectangles in real-world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

MGSE4.MD.8

Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.

Science

S4P1

- Plan and carry out investigations to observe and record how light interacts with various materials to classify them as opaque, transparent or translucent.
- Plan and carry out investigations to describe the path light travels from a light source to a mirror, and how it is reflected by the mirror using different angles.
- Plan and carry out an investigation utilizing everyday materials to explore examples of when light is refracted. Clarification statement: Everyday materials could include prisms, eyeglasses or a glass of water.

S4P2

- Plan and carry out an investigation utilizing everyday objects to produce sound and predict the effects of changing the strength or speed of vibrations.
- Design and construct a device to communicate across a distance using light and/or sound.

5TH GRADE

Art & Design

VA5.CR.1

- Utilize multiple approaches to plan works of art, incorporating imaginative ideas, universal themes and symbolic images.
- Apply available resources, tools and technologies to investigate personal ideas through the process of making works of art.

VA5.CR.2

- Create original works of art that communicate values, opinions and feelings.
- Create works of art inspired by historical, contemporary and/or social events.

VA5.CR.3

- Refine drawings and paintings with a variety of media (e.g. pencil, crayon, pastel, charcoal, tempera, watercolor, acrylic).
- Utilize a variety of materials in creative ways to make works of art (e.g. mixed-media, collage, or use of available technology).
- Apply multiple spatial concepts to create works of art (e.g. one-point perspective, atmospheric perspective, positive and negative space).

VA5.CR.4

- Create sculpture that demonstrates a design concept using a variety of methods (e.g. papier-mâché, paper sculpture, assemblage, found object sculpture).

VA5.Pr.1

- Prepare works of art for exhibition with signature, title and artist statement.
- Choose works of art to be displayed based on reflection and designated criteria.

VA5.RE.1

- Explain how selected elements and principles of design are used in works of art to convey meaning.

- Use a variety of strategies to critique, discuss and reflect on personal works of art and the work of peers.

VA5.CN.1

- Recognize the unique contributions of contemporary and/or historical art forms, including Georgia artists.
- Discuss how social, political and/or cultural events inspire art.
- Recognize how art can be used to inform or change beliefs, values or behaviors in an individual or society.

VA5.CN.2

- Describe and discuss various art-related careers and how design impacts daily life (e.g. art historian, art critic, curator, web designer, game designer, fine artist).

Mathematics

MGSE5.NF.1

Add and subtract fractions and mixed numbers with unlike denominators by finding a common denominator and equivalent fractions to produce like denominators.

MGSE5.NF.2

Solve word problems involving addition and subtraction of fractions, including cases of denominators, e.g. by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate and assess the reasonableness of answers. For example, recognize an incorrect result $\frac{2}{5} + \frac{1}{2} = \frac{3}{7}$, by observing that $\frac{3}{7} < \frac{1}{2}$.

MGSE5.NF.3

Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers (e.g. by using visual fraction models or equations to represent the problem; $\frac{3}{5}$ can be interpreted as “3 divided by 5 and as 3 shared by 5”).

MGSE5.NF.4

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- Apply and use understanding of multiplication to multiply a fraction or whole number by a fraction. Examples: $\frac{2}{3} \times 4$ as $\frac{2}{3} \times \frac{4}{1}$ and $\frac{2}{3} \times \frac{3}{4} = \frac{2 \times 3}{3 \times 4}$.
- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths and show that the area is the same as would be found by multiplying the side lengths.

MGSE5.NF.5

Interpret multiplication as scaling (resizing), by:

- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. Example: 4×10 is twice as large as 2×10 .
- Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $\frac{a}{b} = \frac{n \times a}{n \times b}$ to the effect of multiplying $\frac{a}{b}$ by 1).

MGSE5.NF.6

Solve real-world problems involving multiplication of fractions and mixed numbers (e.g. by using visual fraction models or equations to represent the problem).

MGSE5.NF.7

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

MGSE5.G.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin

in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g. x-axis and x-coordinate, y-axis and y-coordinate).

MGSE5.G.2

Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.

MGSE5.G.3

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

Science

S5E1

- Construct an argument supported by scientific evidence to identify surface features (examples could include deltas, sand dunes, mountains, volcanoes) as being caused by constructive and/or destructive processes (examples could include deposition, weathering, erosion, and impact of organisms).
- Develop simple interactive models to collect data that illustrate how changes in surface features are/were caused by constructive and/or destructive processes.
- Ask questions to obtain information on how technology is used to limit and/or predict the impact of constructive and destructive processes. (Clarification statement: Examples could include seismological studies, flood forecasting (GIS maps), engineering/construction methods and materials, and infrared/satellite imagery.)

6TH GRADE

Art & Design

VA6.CR.1

- Visualize new ideas by using mental and visual imagery.
- Explore essential questions, big ideas, and/or themes in personally relevant ways).
- Formulate and compose a series of ideas using a variety of resources (e.g. imagination, personal experience, social and academic interests).
- Document process (e.g. journal-keeping, sketches, brainstorming lists).

VA6.CR.2

- Produce original two-dimensional works of art using a variety of media (e.g. pencil, marker, pastel, paint, printmaking materials, collage materials, media arts).
- Use technology in the production of original works of art.

VA6.CR.3

- Demonstrate quality craftsmanship through proper care and use of tools, materials, and equipment.
- Utilize and care for materials, tools, and equipment in a safe and appropriate manner.

VA6.CR.4

- Organize the elements of art using the principles of design to compose original works.
- Apply color theory to create visual effects and communicate meaning (e.g. color schemes, relationships, properties).

VA6.CR.5

- Discover, define, and solve visual problems through experimentation with ideas, materials, and techniques.
- Evaluate personal works of art using a variety of artistic and technical criteria.

VA6.CR.6

- Compose preliminary sketches and drafts.

VA6.PR.1

- Write an artist statement by reflecting on finished works of art.

VA6.RE.2

- Describe and analyze the aesthetic qualities of specific works of art.

Mathematics

MGSE6.RP.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

MGSE6.RP.2

Understand the concept of a unit rate $\%$ associated with a ratio $a:b$ with $b \neq 0$ (b not equal to zero) and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $\frac{3}{4}$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”

MGSE6.RP.3

Use ratio and rate reasoning to solve real-world and mathematical problems utilizing strategies such as tables of equivalent ratios, tape diagrams (bar models), double number line diagrams, and/or equations.

Science

S6E3

- Plan and carry out an investigation to illustrate the role of the sun’s energy in atmospheric conditions that lead to the cycling of water. (Clarification statement: The water cycle should include evaporation, condensation, precipitation, transpiration, infiltration, groundwater and runoff.)

S6E5

- Develop a model to demonstrate how natural processes (weathering, erosion and deposition) and human activity change rocks and the surface of the Earth.

S6E6

- Design and evaluate solutions for sustaining the quality and supply of natural resources such as water, soil and air.

7TH GRADE

Art & Design

VA7.CR.1

- Visualize and connect new ideas using mental and visual imagery.
- Interpret essential questions, big ideas and/or themes in personally relevant ways
- Incorporate a variety of internal and external sources of inspiration into works of art (e.g. internal inspiration – moods, feelings, self-perception, memory, imagination, fantasy; external inspiration – direct observation, personal experience, events, pop culture, artists and artwork from diverse cultures and periods).
- Document process (e.g. journal-keeping, sketches, brainstorming lists).

VA7.CR.3

- Demonstrate quality craftsmanship through proper care and use of tools, materials and equipment.
- Utilize and care for materials, tools and equipment in a safe and appropriate manner.

VA7.CR.4

- Organize the elements of art using the principles of design to compose original works.
- Create works of art reflecting a range of concepts, ideas and subject matter by incorporating specific elements and/or principles.
- Apply color theory to create visual effects and communicate meaning (e.g. color schemes, relationships, properties).

VA7.CR.5

- Evaluate personal works of art using a variety of artistic and technical criteria.

VA7.CR.6

- Maintain instructional information, consult resources and create notes.
- Compose preliminary sketches and drafts.

VA7.PR.1

- Participate in art exhibits in the school, local community and/or online.
- Write an artist statement by reflecting on finished works of art.

VA7.CN.2

- Identify and build art skills and habits of mind that support a variety of careers (e.g. higher-order thinking skills, tolerance for ambiguity, judgment in the absence of rule, finding structure in apparent disorder, problem-solving skills, perseverance, creativity).

Mathematics

MGSE7.SP.1

Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

MGSE7.SP.2

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

MGSE7.EE.3

Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an

hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Science

S7L4

- Construct an explanation for the patterns of interactions observed in different ecosystems in terms of the relationships among and between organisms and abiotic components of the ecosystem. (Clarification statement: The interactions include, but are not limited to, predator-prey relationships, competition, mutualism, parasitism and commensalism.)
- Develop a model to describe the cycling of matter and the flow of energy among biotic and abiotic components of an ecosystem.
- Analyze and interpret data to provide evidence for how resource availability, disease, climate and human activity affect individual organisms, populations, communities and ecosystems]

8TH GRADE

Art & Design

VA8.CR.1

- Use mental and visual imagery to visualize and connect new ideas to establish personal artistic voice.
- Investigate essential questions, big ideas and/or themes in personally relevant ways.
- Document process (e.g. journal-keeping, sketches, brainstorming lists).

VA8.CR.2

- Produce three-dimensional artworks using a variety of media/materials (e.g. clay, papier-mâché, cardboard, paper, plaster, wood, wire, found objects, fiber)
- Produce works of art that demonstrate understanding of a range of intentions (e.g. realistic, abstract, non-objective).

VA8.CR.3

- Demonstrate a variety of skills and techniques for two-dimensional and three-dimensional works of art
- Demonstrate quality craftsmanship through proper care and use of tools, materials and equipment.

VA8.CR.4

- Create works of art synthesizing a range of concepts, ideas and subject matter by incorporating specific elements and/or principles.
- Apply color theory to create visual effects and communicate ideas (e.g. color schemes, relationships, properties).

VA8.CR.5

- Revise works of art based on input from the critique process and group interaction.

VA8.PR.1

- Participate in art exhibits in the school, local community and/or online.
- Write an artist statement by reflecting on finished works of art.

VA8.RE.1

- Interpret how the issues of time, place and culture are reflected in selected works of art.

VA8.CN.1

- Articulate reasons for making art throughout history, including the mutual influence of history, culture and art.

VA8.CN.3

- Analyze the connection between personal artistic creation and one's relationship to local and global learning communities.

Mathematics

MGSE8.EE.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

MGSE8.F.2

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

MGSE8.F.3

Interpret the equation $y = mm + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = S^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

MGSE8.F.5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g. where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Science

S8P2

- Construct an argument to support a claim about the type of energy transformations within a system (e.g. lighting a match [light to heat], turning on a light [electrical to light]).

S8P3

- Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.)
- Construct an explanation using Newton's laws of motion to describe the effects of balanced and unbalanced forces on the motion of an object.
- Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia).

HIGH SCHOOL

Art & Design

The standards that the curriculum meets for Art & Design are dependent upon the medium that the teacher chooses to use in the lessons. The lessons are written in such a way that the educator can mold them to fit any medium and at multiple grade levels. The standards listed are met if the lesson is followed as written. Since each is open to interpretation, however, the educator has the freedom to truly make it their own, while meeting the Art & Design standards of their choice.

VAHSVA.CR.1

- Generate and conceptualize artistic ideas and work. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Consider multiple options, weighing consequences and assessing results. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Practice the artistic process by researching, brainstorming and planning to create works of art. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Igniting Art

VAHSVA.CR.2

Choose from a range of materials and methods of traditional and contemporary artistic practices to plan and create works of art. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium

VAHSVA.CR.3

- Demonstrate a variety of skills and techniques for two-dimensional and three-dimensional works of art. Lessons: Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Demonstrate quality craftsmanship through proper care and use of tools, materials and equipment. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Igniting Art
- Utilize and care for materials, tools and equipment in a safe and appropriate manner. Lessons: Design Your Own Stadium; Igniting Art

VAHSVA.CR.4

- Use principles of design to organize elements of art to create unified compositions. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium
- Create two-dimensional works of art that incorporate observational contour drawing, value to model form and an understanding of perspective drawing. Lesson: Design Your Own Stadium
- Create three-dimensional works of art that incorporate a variety of sculptural methods/materials and demonstrate an understanding of relief sculpture and sculpture in the round from a variety of materials (e.g. clay, paper, plaster, wood). Lesson: Igniting Art

VAHSVA.CR.5

- Reflect on, revise and refine works of art considering relevant traditional and contemporary practices as well as artistic ideation. Lessons: Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art

VAHSVA.CR.6

- Make visual/verbal connections through recording artistic research, planning and reflection. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Igniting Art
- Evaluate choice of media, techniques and processes as a means to edit, revise and modify works of art. Lessons: Ohhhhh, I Get It; Igniting Art
- Maintain notes and class information. Lessons: Ohhhhh, I Get It; Design Your Own Stadium; Igniting Art

VAHSVA.PR.1

- Exhibit works of art with a written supporting artist statement that communicates purpose and/or intent. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium

VAHSVA.RE.2

- Self-evaluate in-progress and complete work using criteria such as composition, craftsmanship, technical skill, meeting goals of work and progress over time. Lessons: Ohhhhh, I Get It; Igniting Art
- Develop skills and provide respectful and constructive criticism to peers as part of a community of learners. Lessons: Ohhhhh, I Get It; Igniting Art
- Develop a repertoire of contemporary and historical art exemplars

through art criticism. Lessons: Ohhhhh, I Get It; Igniting Art

VAHSVA.CN.1

- Analyze the ways in which personal experience affects the understanding and appreciation of works of art. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!
- Investigate the role of works of art as visual record keeper. Lessons: Ohhhhh, I Get It
- Identify specific knowledge and skills from other disciplines that inform the planning and execution of works of art. Lessons: Design Your Own Stadium; Ignite Art

VAHSVA.CN.2

- Collaborate in large and small groups with peers and community to examine, discuss and plan projects. Lessons: Ohhhhh, I Get It; Design Your Own Stadium; Igniting Art
- Use creativity and imagination in planning and development of products. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Use critical-thinking and problem-solving strategies to conceive of and develop ideas. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Communicate meaning and ideas through a variety of means, including visual representations, technology and performance. Lessons: Design Your Own Stadium; Igniting Art

VAHSVA.CN.3

- Access resources to research art (e.g. museums, internet, visiting artists, galleries, community arts organizations, visual culture). Lessons: Design Your Own Stadium; Igniting Art
- Identify various art-related careers and post-secondary options. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Design Your Own Stadium; Igniting Art
- Draw inspiration for works of art from the world and resources outside the traditional classroom. Lessons: Ohhhhh, I Get It; Pick Me, Pick Me!; Igniting Art

Earth Systems

SES5

- Construct an argument relating changes in global climate to variation to Earth/sun relationships and atmospheric composition. Lesson: Here Comes the Sun

SES6

- Ask questions to investigate and communicate how humans depend on Earth's land and water resources, which are distributed unevenly around the planet as a result of past geological and environmental processes. Lesson: The Wonder of Water
- Analyze and interpret data that relates changes in global climate to natural and anthropogenic modification of Earth's atmosphere and oceans. Lesson: The Wonder of Water

Environmental Science

SEV1

- Develop and use a model to compare and analyze the levels of biological organization including organisms, populations, communities, ecosystems and biosphere. Lesson: How Low Can You Eat?
- Develop and use a model based on the laws of thermodynamics to predict energy transfers throughout an ecosystem (food chains, food webs and trophic levels). (Clarification statement: The first and second law of thermodynamics should be used to support the model.) Lesson: How Low Can You Eat?

SEV2

- Analyze and interpret data related to short-term and long-term natural cyclic fluctuations associated with climate change. (Clarification statement: Short-term examples include, but are not limited to, El Niño and volcanism. Long-term examples include, but are not limited to, variations in Earth's orbit such as Milankovitch cycles.) Lesson: The Wonder of Water

SEV3

- Analyze and interpret data to communicate information on the origin and consumption of renewable forms of energy (wind, solar, geothermal, biofuel and tidal) and nonrenewable energy sources (fossil fuels

and nuclear energy]. Lesson: Here Comes the Sun

b. Construct an argument based on data about the risks and benefits of renewable and nonrenewable energy sources. (Clarification statement: This may include, but is not limited to, the environmental, social and economic risks and benefits.) Lesson: Here Comes the Sun

c. Obtain, evaluate and communicate data to predict the sustainability potential of renewable and nonrenewable energy resources. Lesson: Here Comes the Sun

d. Design and defend a sustainable energy plan based on scientific principles for your location. Lesson: Here Comes the Sun

SEV4

a. Construct and revise a claim based on evidence on the effects of human activities on natural resources. Human activities: agriculture, forestry, ranching, mining, urbanization, fishing, water use, pollution, desalination and waste-water treatment. Natural resources: land, water, air and organisms. Lessons: How Big is Your Footprint?; The Wonder of Water

b. Design, evaluate and refine solutions to reduce human impact on the environment, including, but not limited to, smog, ozone depletion, urbanization and ocean acidification. Lesson: How Big is Your Footprint?

c. Construct an argument to evaluate how human population growth affects food demand and food supply (GMOs, monocultures, desertification, Green Revolution). Lesson: How Low Can You Eat?

SEV5

a. Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education and gross national product. Lesson: Seriously Sustainable

c. Construct an argument from evidence regarding the ecological effects of human innovations [agricultural, industrial, medical and technological revolutions] on global ecosystems. Lesson: How Big is Your Footprint?

d. Design and defend a sustainability plan to reduce your individual contribution to environmental impacts, taking into account how market forces and societal demands (including political, legal, social and economic) influence personal choices. Lesson: Seriously Sustainable

Physics

SP1

a. Plan and carry out an investigation of one-dimensional motion to calculate average and instantaneous speed and velocity. Analyze one-dimensional problems involving changes of direction, using algebraic signs to represent vector direction. Apply one-dimensional kinematic equations to situations with no acceleration, and positive or negative constant acceleration. Lesson: Falcon 500

c. Ask questions to compare and contrast scalar and vector quantities. Lesson: Falcon 500

d. Analyze and interpret data of two-dimensional motion with constant acceleration. Resolve position, velocity or acceleration vectors into components (x and y , horizontal and vertical). Add vectors graphically and mathematically by adding components. Interpret problems to show that objects moving in two dimensions have independent motions along each coordinate axis. Design an experiment to investigate the projectile motion of an object by collecting and analyzing data using kinematic equations. Predict and describe how changes to initial conditions affect the resulting motion. Calculate range and time in the air for a horizontally launched projectile. Lesson: Falcon 500

SP2

a. Construct an explanation based on evidence using Newton's laws of how forces affect the acceleration of a body. Explain and predict the motion of a body in absence of a force and when forces are applied using Newton's first law (principle of inertia). Calculate the acceleration for an object using Newton's second law, including situations where multiple forces act together. Identify the pair of equal and opposite forces between two interacting bodies and relate their magnitudes and directions using Newton's third law. Lesson: Raise the Roof

e. Develop and use a model to describe the mathematical relationship between mass, distance and force as expressed by Newton's law of universal gravitation. Lesson: Raise the Roof

SP4

e. Plan and carry out investigations to describe common features of light in terms of color, polarization, spectral composition and wave speed in transparent media. Analyze, experimentally and mathemati-

cally, aspects of reflection and refraction of light waves, and describe the results using optical ray diagrams. Perform calculations related to reflections from plane surfaces and focusing using thin lenses. Lesson: Lights, Camera, Mix Those Colors

Mathematics

MGSE9-12.S.IC.4

Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. Lessons: How Big is Your Footprint?; Seriously Sustainable

MGSE9-12.F.IF.4

Using tables, graphs and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. Lesson: Falcon 500

MGSE9-12.F.IF.7

a. Graph linear and quadratic functions, and show intercepts, maxima and minima (as determined by the function or by context). Lesson: Falcon 500

MGSE9-12.A.CED.1

Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear, quadratic, simple-rational and exponential functions (integer inputs only). Lesson: Falcon 500

MGSE9-12.G.SRT.2

Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain, using similarity transformations, the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. Lesson: Raise the Roof

Computer Science

BCS-CMW-6

d. Students will demonstrate an understanding of how numbers and characters are represented in a computer. Define the terms bit and byte. Encode/decode a text message using ASCII or Unicode. Determine the number of patterns possible given the number of bits used. Convert numbers between decimal and binary. Lesson: Lights, Camera, Mix Those Colors

Mercedes-Benz Stadium Curriculum Writers

Christina Beck is a biology and advanced placement environmental science teacher at Pilot Point High School where she has been teaching for two years. She holds a master's degree in science education and curriculum from the University of Texas at Arlington and is working on her second master's degree in educational administration at the University of North Texas. Her specialization is using inquiry-based learning to actively engage students in science education. She is passionate about sustainable farming, alternative energy, creating urban farmers, and involving more kids in agriculture. Christina believes that a majority of children's learning takes place outside of the classroom in real-life, hands-on experiences. She uses this philosophy to create lessons that promote community involvement and local action to affect the global community in a positive way. When she is not teaching or writing curriculum, Christina works in her Denton, Texas apiary and urban farm with her husband, children, chickens and miniature cows.

Sherry Dieterich is a mathematics and computer science teacher at Braswell High School in Denton, Texas. She has been teaching high school for 12 years. She holds a Bachelor of Science in Computer Science with a minor in mathematics and a master's degree in education administration. Sherry's goal is to help students prepare for the world after high school, and she appreciates the learning and community opportunities offered by Mercedes-Benz Stadium. She is married and has a daughter who attends the University of Texas at Austin.

Stephanie Garcia is a physics teacher at Braswell High School in Denton, Texas. She has taught all levels of physics in the Denton Independent School District for the past 13 years and has been on the district's physics curriculum writing team for much of her career. She holds a Bachelor of Science degree from Texas Tech University in multidisciplinary sciences with an emphasis in chemistry. Stephanie is dedicated to empowering students to be successful in physics at any level. As a coach's wife and mom to two little girls, when Stephanie is not teaching, she can be found at the soccer field with her girls.

Mandy Nabors is a fourth grade teacher at Woodrow Wilson Elementary School in Denton, Texas. She holds a bachelor's degree in interdisciplinary studies and is finishing a master's degree in curriculum and instruction from Texas A&M University. She has more than 20 years of experience in elementary education. Mandy believes that all students can learn if they are challenged to ask questions, imagine a possibility, make a plan, struggle with the solution, and build their schema through process and experience. In her classroom, students are challenged with STEM activities that push them to engineer products and build 21st-century skills. Mandy is thankful for curriculum opportunities that bridge STEM activities and fun, interactive, real-world experiences. A native Texan, Mandy lives in Providence Village, Texas where she is honored to be a wife, sister, daughter and aunt. She spends her free time reading and pursuing various creative outlets.

Krissi Oden is a visual arts teacher at Braswell High School in Denton, Texas. She holds a master's degree in art history and museum education from the University of North Texas and a second master's in art education from Texas Woman's University. She has more than 12 years of experience in art education with a philosophy that focuses on a Constructivist approach to teaching and learning. Krissi's goal as a teacher is to empower students to celebrate their uniqueness, and to build upon their own experiences and cultures as they learn and grow. She also believes that learning extends beyond the classroom and is excited about the potential of the Mercedes-Benz Stadium curriculum to take learning to the next level in a fun and interactive space. Krissi is a native Texan and lives in Denton, Texas where she loves spending time with her family, as well as working on her painting and photography.