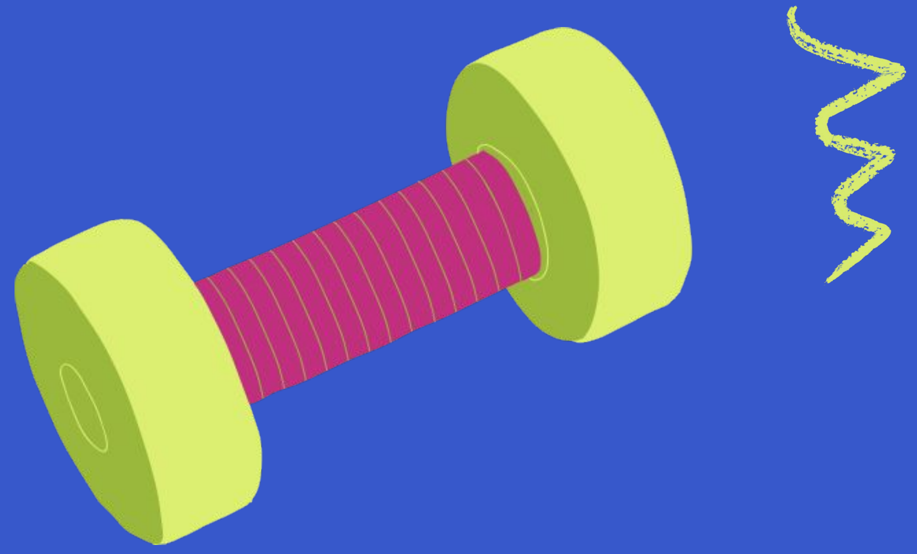
The Gold Medal Challenge:

Exploring STEM Through the Olympics!

Marshfield Clinic Health System

WOSTA Working together to help youth thrive.

WISCONSIN OUT OF SCHOOL TIME ALLIANCE



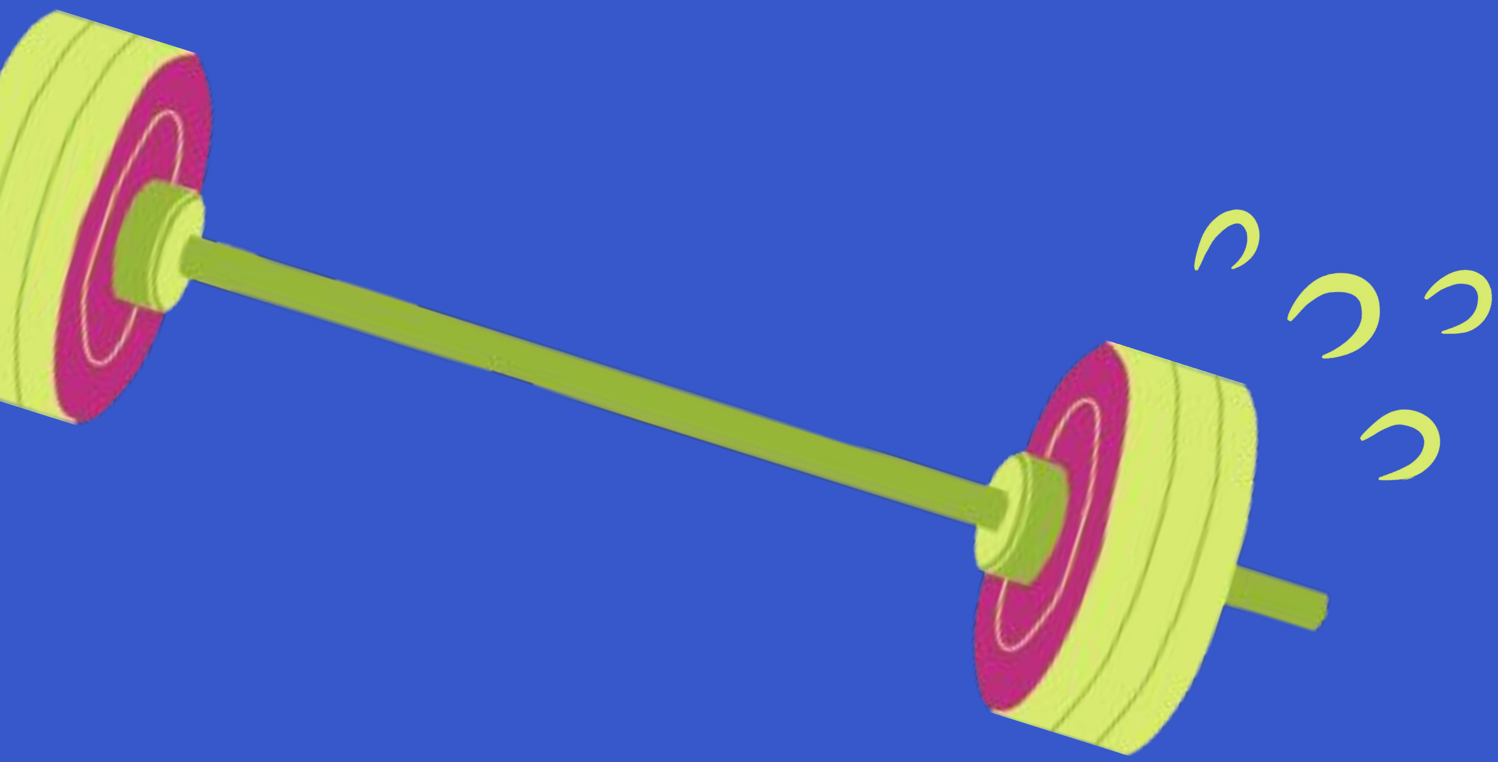
Preface

Dear OST Staff,

Summer is your time to *shine*! WOSTA knows you're giving it your all during this season to provide youth with positive, engaging experiences and we want to help. As the Summer Olympics kick off, let's go for the gold with some amazing STEM activities!

In this collection, you will find a series of Olympic-inspired STEM lessons designed to give youth opportunity to practice an engineering mindset. **An engineering mindset refers to the attitudes and thinking skills associated with engineering – using a systematic engineering design process, considering real-world problems, applying math and science, and working in teams.**

There are three sets of lessons. The time and materials needed increases with each set but all give youth the opportunity to ask questions, think critically, and share their reasoning with peers. Add and adapt as needed for your population.



For more STEM resources and tools, visit our website.
Learn about an engineering mindset and how to foster it here.

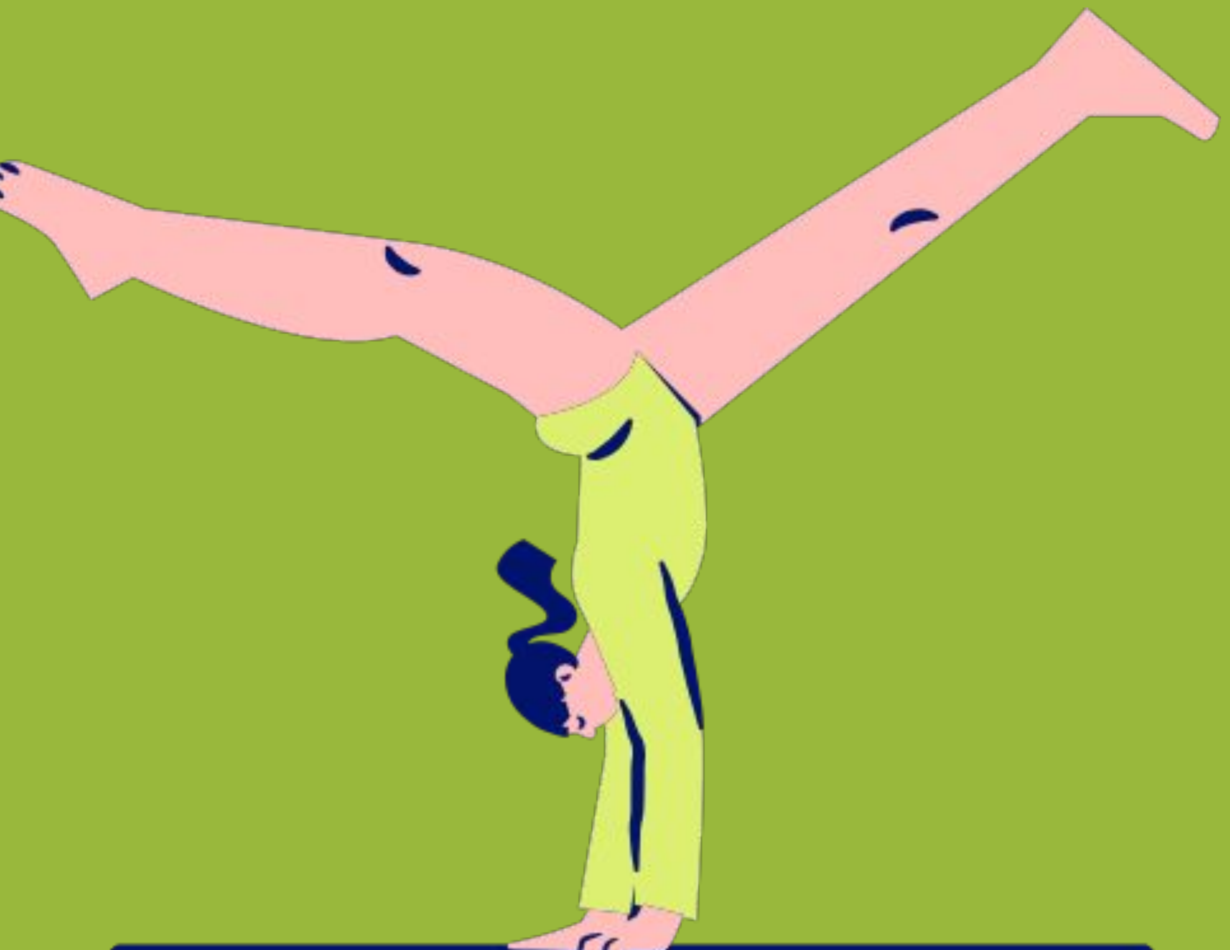
FAST TRACK TO FUN

Everything you need for these activities is probably already in your supply closet. Grab some technology to share images with youth and you're ready to go! Through these activities, adults remind youth that we can find examples of math and science all around the real world and invite youth to stay curious.

Block Challenge: Paris Architecture Edition

Objective: Kids can talk about examples of architecture and their features, identify geometric shapes in examples of architecture, and build scale models of examples of architecture

Materials: Legos, Magnatiles, geometric blocks, and/or similar construction materials



Block Challenge: Paris Architecture Edition

You say: Today I want to teach you that Paris, France, the city hosting the 2024 Summer Olympics, has some really amazing architecture. Look at the amazing venues for the games and other beautiful landmarks of Paris. Today I want to ask you: Which is your favorite? What shapes do you see in your favorite structure? What do you think the architects and builders of this structure have to think about while planning?

Kids choose: allow students to choose the building/venue they want to build a model of, their building material, and if they will work independently or in a small group.

Painted Rocks Challenge: Flags Edition

Objective: Kids can talk about examples of country flags including the shapes, colors, and symbols they see; kids can replicate a country's flag's shapes, colors, and symbols.

Materials: paintbrushes, acrylic paint, minimum one rock per child

Painted Rocks Challenge: Flags Edition

You say: Today I want to teach you that each country has a unique flag. The shapes, colors and symbols all have a special meaning that represent something important about the nation it represents. Look at these examples. Today I want to ask you: Which is your favorite? What colors, shapes, and symbols do you see in your favorite? What do you think they might represent?

Kids choose: allow students to self-select the rock they will paint and the flag they will replicate, student choose if they will work independently or in a partnership

CHALK CHALLENGE: LONG JUMP EDITION

OBJECTIVE: Kids can use chalk to demonstrate how far world record long jumps are; kids can measure and compare their own long jump records

MATERIALS: Chalk, measuring tape/utensils, space to mark on pavement

CHALK CHALLENGE: LONG JUMP EDITION

YOU SAY: Today I want to teach you about an Olympic event called the long jump. The goal is pretty simple: to jump as far as you can and land on both feet. The men's world record is 8.90 meters and the women's is 7.40 meters? Today I want to ask you: How far do you think your personal long jump record could be? How big is a meter and what other ways of measurement can be used in this challenge?

KIDS CHOOSE: Allow kids to choose if they want to take a turn being a long jumper, chalk marker, measurement capitan, or all three jobs.

POWER LIFT

Get your minds working up a sweat with these open-ended, inquiry-based activities! When supporting youths' engineering mindset, remember to help them embrace the struggle and know that there's no one right answer. These activities are purposefully full of opportunities for kids to own the process of questioning and experimenting without being preoccupied with "getting it right".

HEALTHY HEARTS

OBJECTIVE: Kids can use the scientific method (ask questions, form hypotheses, experimenting, collecting information, forming conclusions, repeat) to engage with the thinking prompt: What affects a person's heart rate?

MATERIALS: Timers, space and materials for physical exercise, music, writing utensils

Healthy Hearts

You Say: Olympic athletes usually know a lot about their heart rate:how fast or slow their heart is beating. Today I want to pose a question for you to think like a scientist about. Remember that scientists ask questions, try things out, observe changes, and share their thinking with peers. I wonder, What affects a person's heart rate? You'll get a chance to experiment to see how activities like exercise, reading, listening to music, and more change a person's heart rate. Some factors/variables you might want to think about include how you will measure heart rate (see one option here), how long each activity will be done before measuring the change, and how long to wait in between activities to bring your heart rate to 'normal'. What other factors/ variables might we want to think about in this experiment?

Kids Choose: Allow youth to determine how they will conduct the experiment (variables of activities vs rest time, how to measure heart rate, how to collect and share findings); youth can decide to work independently or in a partnership

Bounce, Bounce!

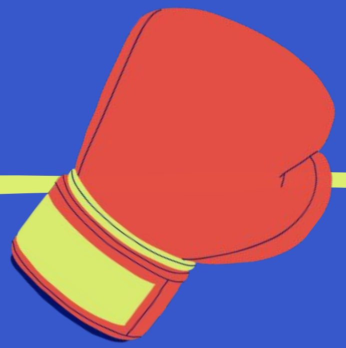
Objective: Kids can use the scientific method (ask questions, form hypotheses, experimenting, collecting information, forming conclusions, repeat) to engage with the thinking prompt: What makes a ball bounce high?

Materials: multiple different types of sport equipment balls of different size, shape, and material; access to different types of flooring (indoor, outdoor, paved, etc), measuring tools (measuring tape, yardsticks, etc), writing utensils

Bounce, Bounce!

You Say: Have you ever thought about what makes sports equipment, like a really bouncy ball, work well? Today I want to pose a question for you to think like a scientist. Remember that scientists ask questions, try things out, observe changes, and share their thinking with peers. I wonder, what makes a ball bounce high? You'll get a chance to experiment with different materials in different spaces. Some factors/variables you might want to think about include the shape, texture, and material of both the ball and of the thing you're bouncing the ball off of. What other factors/variables might we want to think about in this experiment?

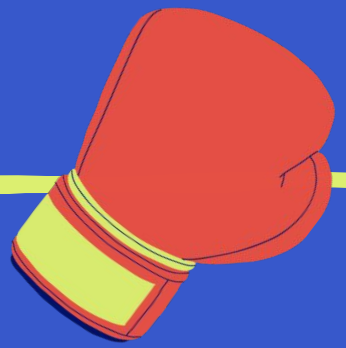
Kids Choose: Allow youth to determine how they will conduct the experiment (what variables they consider: balls, surfaces, angles of motion, etc., how to measure the height of bounces, how to record and share their findings); youth can decide to work independently, in a partnership, or in a small group



Sun Block

Objective: Kids can use the scientific method (ask questions, form hypotheses, experimenting, collecting information, forming conclusions, repeat) to engage with the thinking prompt: How effective are different ways of protecting skin from the sun?

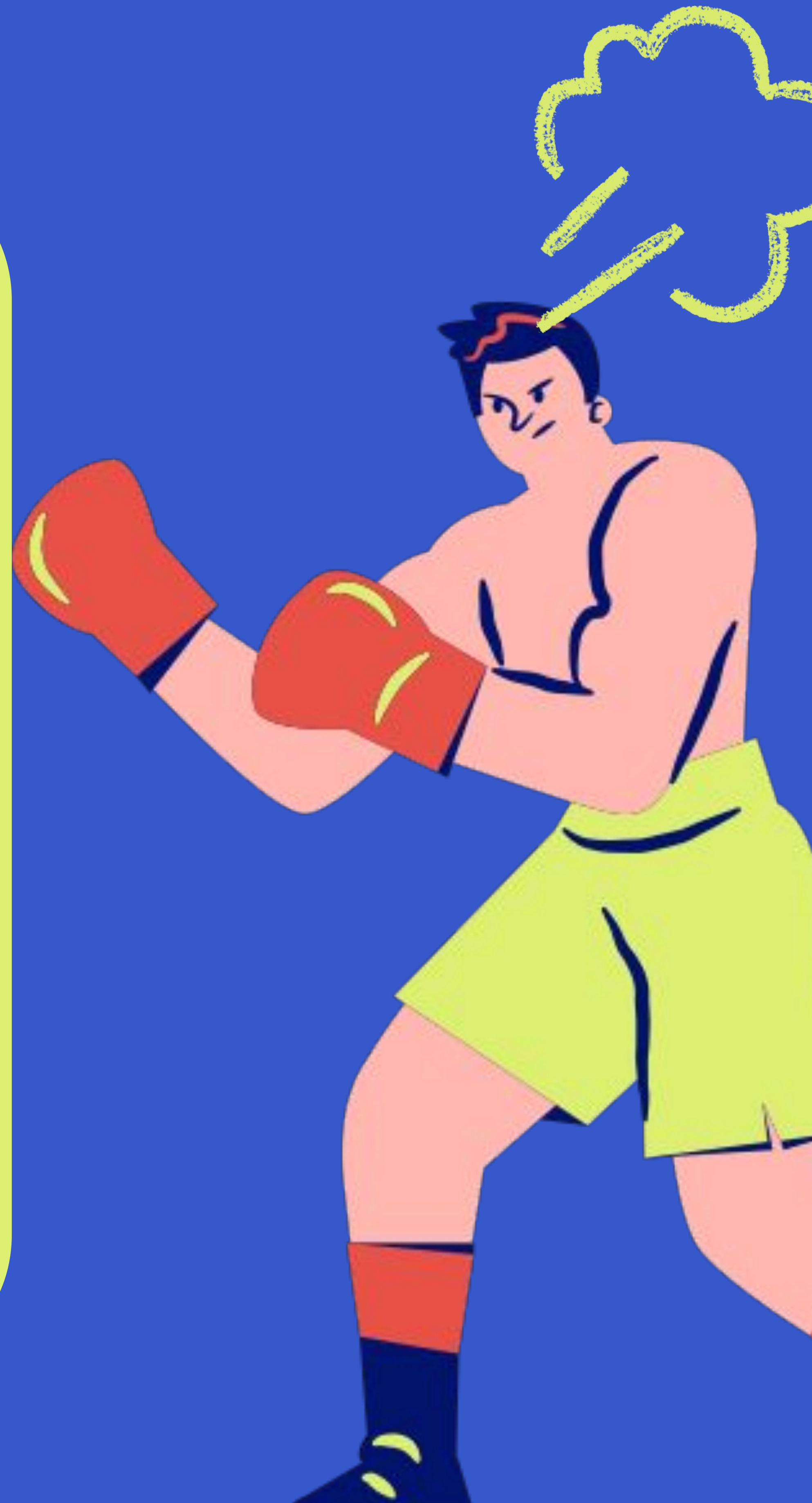
Materials: construction paper, transparent and opaque small objects, spray and lotion sunscreen bottles in different SPF levels, access to a sunny space for paper to sit uninterrupted for several hours, writing utensils



Sun Block

You say: All Olympians AND spectators face a serious danger in Paris: sun exposure! Today I want to pose a question for you to think like a scientist about. Remember that scientists ask questions, try things out, observe changes, and share their thinking with peers. I wonder, How effective are different ways of protecting skin from the sun? You'll get a chance to experiment with different types and levels of sunscreen on paper instead of skin (never experiment with your own safety!). Some factors/variables you might want to think about include how much SPF is applied, how it is applied, and how it compares to other ways of protecting the paper from the sun's rays. What other factors/ variables might we want to think about in this experiment?

Kids choose: Allow youth to determine how they will conduct the experiment (variables such as liquid vs spray SPF, different materials to cover paper, time intervals in the sun), how to measure "sun protection", how to collect and share findings; youth can decide to work independently, in a partnership, or in a small group



Deep Dive

These activities are designed to take some patience and perseverance plus give youth a chance to get a little competitive! Engineering is front and center in these project-centered, outcome-oriented activities. Build interpersonal capacities further by involving youth in setting the details of how to achieve their shared goal.

Don't Crack Your Noggin!

Objective: Kids can construct a model able to protect an egg from breaking when dropped from a height.

Materials: Scientists' Choice! Considerations: make sure youth have strategies and tools for binding materials together. The recycling bin often has great (and free) building materials inside.

DON'T CRACK YOUR NOGGIN!

YOU SAY: Olympians wear specialty gear to protect themselves when competing. Today I want to give you a problem to solve inspired by that specialty gear. You'll get a chance to decide on some key details of the experiment, have time to build, then test your creation. I wonder, Given a set of materials, how can you protect a fragile egg from a drop? You'll want to consider what you know from real life about the how helmets and other sports safety gear are made and how that could inspire your work. What else are you considering as you begin to brainstorm?

KIDS CHOOSE: Staff facilitating the activity will assist youth in agreeing upon expectations for the experiment such as: the height of the drop, the allowable building materials, and whether each entry in the competition must use the same building materials. Youth decide to work independently, in a partnership, or small group.

Wind and Water Regatta

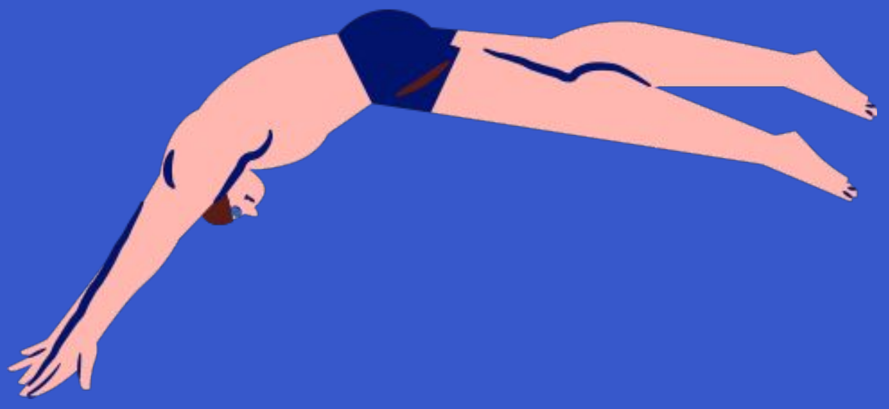
Objective: Kids can engineer a model that can successfully navigate a water course without sinking.

Materials: Scientists' Choice! Considerations: make sure youth have strategies and tools for binding materials together. The recycling bin often has great (and free) building materials inside.

Wind and Water Regatta

You say: Did you know that sailing made its debut in the Olympics in Paris back in 1900? Today, I want to ask you to think about the water and wind that power those sailboats and what mechanics inside the boat harness that power. You'll get a chance to decide on some key details of the experiment, have time to build, then test your creation. I wonder, what could you create to win a race across a water race course? You'll want to consider ways engineers before you have already succeeded: boats use rudders, sails, and even wheels to get where they need to go. What else are you considering as you begin to brainstorm?

Kids choose: Staff facilitating the activity will assist youth in agreeing upon expectations for the experiment such as: the length and location of the float challenge, if natural or man-made wind will be used, the allowable building materials, and whether each entry in the competition must use the same building materials. Youth decide to work independently, in a partnership, or small group.



THANKS &
HAPPY LEARNING!