Social Studies 5th Grade – April 13-17

WRITE A CONSTITUTION:

Suppose your class or your family had a Constitution. How would it describe the role of the teacher or parents be and the role of the students or children. What rules would be included? What rights would be spelled out? How would responsibilities be described? Work to write a constitution for your class or family. Describe the roles, rules, rights, and responsibilities that would govern everyone. Then compare your constitution with the constitution of the United States.

Science 5th Grade – April 13-17

Complete ONLY 2 of the following activities and complete as many parts as possible. The activities are STEM Activities created to help students with Science, Technology, Engineering and Mathematics. Try to choose an activity that you have all the materials at your house. Most of the activities you will have most of the materials in your house, some you may not, so please don’t choose that activity, or you can improvise as well. I understand you may not have all the material to do all of these, so the best that you can under these circumstances. Please have fun and be engaging, if a project doesn’t work out the way you imagined, that’s okay, I will give you credit for trying, stick with it. If you are able, take a picture of your activity and email it to me I would love to see it, don’t forget to answer the STEAM questions too. Again, if you have any questions or concerns please email me at bbaker@rockwoodschools.org or call (814) 926-4688 Ext. 2010
**CHALLENGE**

Create a tall building. It should not fall down during an “earthquake” (when you drop a heavy book beside it).

**HINT:**
Earthquakes shake side to side. A wider base or stronger connections can help your building stand strong.

**WHAT’S GOING ON?**

- There are very large plates under the surface of the earth that move continuously and slowly past each other. Sometimes the pieces slide under or against each other. As the plates move they put forces on themselves and each other. When the force is large enough, the crust breaks. When the break occurs, the stress is released as energy which moves through the earth in the form of waves, which we feel and call an *earthquake*.

**STEAM**

- Research what causes an earthquake. How does this information help you build a better structure?
- Scientists have developed base isolators so buildings don’t sit on the ground. How would a base isolator help your design?
- Make your building taller. How did you change the design so that your building didn’t fall during an “earthquake”?
- Use what you have learned about earthquakes to create an earthquake safety poster.
- Drop the book from different heights. How does it affect the movement of your structure? Make a chart to show the results.
**TAKE IT SLOW**

**CHALLENGE**

Design several ramps to make a toy car travel slow, slower, and slowest.

**GET YOUR GEAR**
- toy car
- cardboard ramps
- sandpaper
- rubbery shelf liner
- play dough
- yarn

**HINT:**

Speed bumps are used to slow down cars in real life. What materials can be used to make speed bumps?

**WHAT'S GOING ON**

Friction is common in everyday life. What caused friction in your ramps? Where do you see friction working in your classroom?

Try other materials: paper towels, fabric, aluminum foil, waxed paper, etc. Which ones cause more friction? Less friction?

Design a wheelchair ramp that is easy to get up, but helps people go down it slowly too.

Create a traffic sign for each ramp. Are tools like pencils, crayons, paint, chalk, and even erasers work without friction?

Use a stopwatch or clock to time how long it takes the car to reach the end of each ramp. Compare the times.

Friction is the resistance an object has when it rubs against another object. It happens anywhere two things touch.

Your shoes and a carpet create a lot of friction together. That means your feet don't slide around and you can walk. But, ice does not cause much friction, so your shoes slide easily. Cars stuck on ice often place rough kitty litter under the tires to increase the friction between the tire and the ice. If friction didn't exist, you couldn't run or walk!
**Bridging the Gap**

**Challenge**
Build a bridge that is at least 12 inches long. It should be able to support at least 10 pennies in the middle.

**Hint:**
Bridges need support underneath or from above. Look at pictures of real bridges to see how they are built.

**What’s Going On?**
There are many types of bridges. They all have different ways to support the weight.

- **Beam bridges** have a straight surface that is supported by pillars.
- **Arch bridges** use a curve, like an upside down U, under the bridge surface to hold the weight.
- **Truss bridges** use connecting triangle shapes to support the bridge surface.
- **Suspension bridges** have two tall towers. Strong steel cables hang from the towers and hold up the bridge surface.

**STEAM**
- There are many forces acting on real bridges. Can your bridge withstand more weight? Wind? An earthquake?
- Workers often use cranes and other machines to build bridges. What tools did you use?
- Some bridges are designed to move and change. Can you change your design to create a drawbridge?
- Look at famous bridges like the Golden Gate Bridge (San Francisco) or the Tower Bridge (London). Make your bridge beautiful too.

Experiment with your design: try adding or removing supports or using different shapes or angles.
CLIMBING WATER

CHALLENGE

Move water from one cup to another without touching or pouring it.

HINT:

Think about what a paper towel does to water. How can you place the paper towel to help the water move?

WHAT'S GOING ON?

The paper towels show **capillary action**, which is when water moves through narrow spaces against gravity.

Paper towels are made of cellulose fibers. They have tiny spaces between them. Water molecules want to stay together, so they go up through the spaces like they are straws.

Plants use capillary action to draw water up through their stems to their leaves. Place a stalk of celery or a carnation in colored water. What happens?

STEM

- How do trees get water to the leaves at the very top? How do they overcome gravity?
- Try different cups and different brands of paper towels. How do they affect the way the water moves?
- Design a toy or game that uses capillary action.
- How can you use more cups and food coloring to make a rainbow? What colors mix to make other colors?
- How high can water climb up a paper towel before gravity stops it? How quickly does the water move?
**Growing, Growing, Gone**

**Challenge:** Grow a plant without soil.

**Hint:** Make sure the seeds have everything else they need to grow: air, sunlight, and water.

**What's Going On?**

- **Plants usually need soil to grow.** Why do you think these seeds sprouted without soil? Would they sprout in only a plastic cup?
- **Gardeners use tools to loosen the soil and prepare it for seeds.** What tool could you use to break apart your "soil"?
- **Create a building or statue with your "soil" so the plants grow in a certain shape.**
- **Landscape architects use their knowledge of plants to build beautiful spaces.** Design a garden people would like to visit.
- **Measure the height of your sprout every day for a week.** Make a graph to show how tall it grew.

**Get Your Gear**

- Water
- Paper towels
- Sponges
- Clear plastic cup
- Quick-sprouting seeds (grass or chia)

Plants need four things to grow: air, water, soil, and sunlight. They get energy to make food from sunlight. Soil gives them nutrients and a place to grow. They use carbon dioxide from the air to make food. Water carries moisture and nutrients to all parts of the plant. Without one or more of these, a plant will die, or a seed will not sprout.

Plants can grow in surprising places. NASA has grown plants on the International Space Station. Next up, Mars!
POWERFUL PAPER

CHALLENGE

Use only paper and tape to create a structure that will hold a heavy book. It must be able to stand on its own.

HINT:
Try folding or rolling the paper. What shapes are the strongest?

WHAT'S GOING ON?

Rolling the paper into tubes creates layers of paper, which add strength.

Folding the paper into tubes with shapes like squares and triangles adds even more strength. It also adds stability, so the book doesn't wobble.

Triangles are the strongest shape. Forces pushing down on the point of a triangle are distributed down the sides and to the base.

STEAM

What force does the book show? How does gravity affect your structure?

Try making several different structures, even if your first one works well. Can you improve your design?

Look at pictures of bridges. What do you notice? How would you design a bridge?

Use your structure to design a skyscraper that can hold a heavy statue on the very top.

How much weight can your structure hold? Graph the maximum weights of each structure you tried.
HOME SWEET HOME

CHALLENGE
Create a home that is best for an imaginary animal. What makes it the best home for this animal?

HINT:
Think about the homes of real animals. Why do different animals have different homes?

STEAM
How is the habitat adapted for your animal? Does your animal need to be warm? Where would it be safe? Does it need to hide?

What other materials could improve your habitat? Find another item to make the habitat even better.

Is your habitat stable? Can it stand up to movement and rough weather? Make it harder to break.

Place your habitat in a shoe box and camouflage it. Make it hard for predators to see.

Does your habitat hold only one animal? How big would you have to make it to hold a mom and her babies? A family?

WHAT'S GOING ON?
Animals all have different homes, or habitats. Each habitat is best for that type of animal.

Snails, turtles, and hermit crabs have shells that are homes they take along everywhere they go. Bears, chipmunks, and hedgehogs create nests and dens to keep warm when they hibernate during winter. Lemurs and monkeys are built for living in trees. Their hands, feet, and tails grip branches easily.
ANY WAY THE WIND BLOWS

CHALLENGE

Make a wind sock that can tell the direction and relative speed of the wind.

GET YOUR GEAR

- cardstock or sturdy paper
- crepe paper streamers
- twine
- paper clips
- tape or glue
- hole punch

HINT:

Your wind sock needs a base and a part that can move in the wind.

WHAT'S GOING ON?

- Why is it important to know what the weather is? How does it affect your life?
- Meteorologists use many tools to predict the weather. What other weather tools could you create?
- Your wind sock needs to hang outside. How can you improve the design so that it works in all kinds of weather?
- Children’s Day in Japan is often celebrated by flying carp wind socks. Look at examples and make your own version.
- For 10 days, record the speed and direction of the wind and the weather at the time. Graph it. What did you learn?

- The direction and speed of the wind, plus clouds and other clues, help meteorologists predict the weather.

- It is easy to tell the wind direction with a wind sock. If the wind sock is pointing south, the wind is coming from the north.

- A wind sock can also tell the relative speed of the wind. If it is not windy, the wind sock will hang without moving. In a low wind, it will droop. If the wind is high, the wind sock will fly horizontally.
**MOVE IT, MOVE IT**

**CHALLENGE**

Build a machine that can move an item from one end of the table to another.

**HINT:** Use a rolling motion to move the item. What material can help you keep the item on a level surface?

**WHAT'S GOING ON?**

Simple machines make moving items easier in different ways. Screws, inclined planes, levers, and pulleys are all simple machines. Some machines use more than one simple machine to do work in a special way.

A conveyor belt is made of two pulleys—one at each end. When they move together, they rotate a flat belt. The belt moves, and anything on top of it travels from one end to the other.

**STEAM**

- Was there friction anywhere in your machine? How did it affect the movement?
- Does the size of the rollers matter? How can you modify the belt to work better?
- What problem could this machine solve? Create a machine to make a part of your life easier.
- Research Rube Goldberg. Can you use simple machines to make a design like his?
- Compare the length of your belt to the size of the roller. What do you notice?