Summer STEAM in SDOC

Discover new things, Investigate your questions, Solve problems!

Terrific Transportation	Chemistry is Cool	Plants and Animals are Perfectly Amazing	Arts and Entertainment	Solving Problems of the World
				
Everything moves! How do we get from one place to another?	*Solutions do different things when they meet. How can we investigate their properties?*	*Carefully watch an animal or a plant that you see outside or in your own home. What can we learn?*	*There are many STEAM careers in arts and entertainment. Try your hand at some of these!*	*How can you solve a problem of the world? Make a discovery or create and invent!*
Space! Make a rocket that can go straight up or a spacecraft that can travel on a new planet. Use paper towel or toilet paper holders and other materials from around the house to build your spacecraft. Can you make it move? How far can it travel? Here are some examples.	**Twirling Milk** Create a color display when adding different solutions together. Why do the colors dance? See below or this resource.	**Printmaking with leaves, flowers, and plants** Look very closely at different kinds of plants. Do you see patterns? Make art by using nature's beauty. How else can we learn from nature? Look below or here for more ideas.	**Ice Pop Watercolor Landscapes** Paint using ice (see below for details)! How does painting using ice feel look and feel different than painting with warm "paints"? Explore different ways to create art.	**Our Oceans** Sea turtles spend most of their time in the ocean. When it is time to lay their eggs, they come to the shore and lay their eggs. The dig holes on beaches and dunes to nest and lay their eggs. With so many people visiting our beaches, how can we share the beach with the sea turtles? **Design a plan to help protect sea turtles.
The Land! Create a car that can travel frontwards and backwards using wind power. Here are some ideas.	**Lava Lamp** Make a lava lamp at home and watch as things combine and break apart. How can what we see be used in other ways? (Below and Additional resource)	**Biomimicry** How does a bird or an insect fly? How does a tree stay upright during a storm. Use nature to inspire a design you create! Use these questions to come up with your own idea: What job is it (the animal or plant) doing? Is it flying? How is it doing that job? Is it flying by flapping its wings? What are the wings shaped like?	**Art using recycled plastic** What kind of sculpture can you create using clean recycled plastic and paper? See all the artists who have created art from ocean plastics by clicking here!	**Our Land** We have a limited amount of land on our planet. How can we help nurture and protect it? Choose a problem and design a solution: **Is there trash on the ground where you live? Design trashcans that everyone could and would use. **There are many different kinds of animals and plants on our
Trains! Make a train where each boxcar can link to another and can carry things. How will each car connect	**Sidewalk Chalk** Make your very own sidewalk chalk! Go here for ideas and directions. What can sidewalk		**A new Disneyworld ride** Do you have a favorite ride? Use your imagination to invent a new ride! Ask questions, do some research, plan your ride and	

to the next? What can the cars carry?	chalk be used for? Come up with more ideas!	Can you design something that is similar to do a similar job? Ask, research, design, create, test, and revise!	draw it on paper. Now, try and make a model of the ride. Can you test it? Revise it and make it even better! The next step is to sell your idea to Disney!	planet. How many can you name? Design a plan to teach others about different kinds of plants and animals on our planet (or pick one) and how we can take care of them. **Think about your own ideas about our land. How can you learn about and design solutions to questions you have?
Water! Make a boat that can float and carry things. Use a plastic pool or large bin with water and test your boat. Have a competition—whose boat can carry the most weight?	**Bubbles!** Try to find the best combination of dish soap and water to make the biggest bubbles! Can you make different shapes? Go here for more ideas.	**Bottle Garden** How can we reuse plastic water bottles? Plant a garden! Use washed plastic bottles to create your own planter. Here are lots of ideas!	**Movies** Create your own movie! Fold a piece of paper in each direction; this will give you 4 squares. In each square, draw a picture that shows a scene from your story. Use multiple pages for longer stories. Tell your story, showing each picture as you narrate. If you have a device available with a video, point the camera to each scene, telling your story as you go from scene to scene.	**Build a Stage** Ask, research, design, create, test and revise! Build a stage or another structure that will accomplish your goals (See below).
Feet! Observe your feet and the feet of other animals (birds, a pet dog or cat, insects, and more). How does each animal walk? Create a foot out of household materials. Can you move the foot you made across a surface? How does it compare to real animals?	**Ice Cream!** Make ice cream in a bag at home. What do you think each of the ingredients does? What happens if you remove one of the ingredients? How can you make this idea work even better? Ice Cream in a Bag	**Pet Feeder** Does your dog or cat eat too fast? Design a new food dish that helps your pet slow down.	**Making music from home** Design a drum set! Make a rain stick using a paper towel holder! Or, how about a guitar using a cereal box? Create a whole band of instruments to play. What other kinds of music can you make using materials you have?	**Our Natural Resources** Have you heard the word sustainable? It means to keep a balance, especially with natural resources like water, land, air, coal, and forests. To keep a balance, it is important not to use up all of these resources. What kind of resources do you use in your home? Make a list. What can you do to keep a balance in your house? Design a Sustainability Plan for your own home.

Some instructions are below. Others are linked within the boxes above:

Lava Lamp

1. Fill a jar with water ¼ full.
2. Add vegetable (or baby oil) until the jar is ¾ full.
3. Add a few drops of your favorite color of food coloring. What do you think will happen?
4. Add ¼ tablet of Alka Seltzer.
5. Observe what happens! Think about the properties of each solution in the experiment and why it reacts with other solutions the way it does.
   Additional resource

Twirling Milk

1. Cover the bottom of a plate or shallow bowl with milk (~1/4")
2. Add several drops of different colors of food coloring to the milk. Do not mix.
3. What do you think will happen?
4. Add a small drop of liquid soap to the center of the milk. Use a dropper or a Q-tip to add the drop of soap.
5. Watch what happens! Try your own experiment, using different kinds of milk, a variety of colors, and drops of soap in different places.
   Additional resource

Ice Painting

1. To make the colored water, add at least 5 drops of food coloring to about ¼ cup of water. Start with the primary colors. Mix well. Create the desired colors by mixing your food coloring:
   orange (yellow + red)
   green (yellow + blue)
   purple (blue + red)
2. Test the color intensity by painting with the colored water on plain white paper. If you want the color to be brighter or more intense, add a few more drops of food coloring until you achieve the desired color.
3. Prepare your ice cube tray. Spoon in the colors into each tray section. Once satisfied with the colors, put the tray inside the freezer.
4. Check on your ice cube tray after about 30 to 45 minutes. When the colored water is half-frozen, stick in a craft stick handle into the center of each ice cube and freeze again until solid.
5. When the ice cubes are solid frozen, take out the ice tray from the freezer and allow it to stand at room temperature for a few minutes. Twist the ice tray slightly to loosen the ice cubes.
6. Use heavy weight paper to paint with the ice. As they paint, make statements or ask questions such as: Do you notice the ice is melting? Is it cold or hot? What is happening to the paper?

Wind Powered Car

Materials

- Corrugated cardboard
- Construction paper or cardstock
- Wooden skewers (3)

- Plastic straws (2)
- Plastic bottle caps (4)
- Tape
- Scissors
- Fan

1. Cut out a piece of cardboard to form the body of your car.
2. Tape two straws to the bottom of your car, one at each end to form the axles. Make sure the straws are parallel.
3. Get help from an adult to carefully poke a "+"-shaped hole in the center of each bottle cap.
4. Push a wooden skewer through the hole in one of the bottle caps.
5. Thread the other end of the skewer through one of the straws.
6. Push a bottle cap onto the end of the skewer opposite the first bottle cap. You just made an axle with two wheels!
7. Repeat steps 4 through 6 to make the other axle.
8. Make sure the axles can spin and the car can roll smoothly without getting stuck. If needed, adjust the wheels so they are not too wobbly.
9. Poke a small hole in the middle of the cardboard.
10. Insert a wooden skewer upright into the hole to form a mast. Secure it at the base with plenty of tape. If it is still too wobbly, you can build a diagonal support out of a piece of cardboard.
11. Cut out a shape for a sail from a piece of paper.
12. Poke the upright skewer through both ends of the sail to hold it in place.
13. Place your car in front of a fan, turn on the fan, and watch it go!

Test your car. Can you change the design to make it faster? Can you try different materials to make the wheels and more?

(Adapted from sciencebuddies.org)

Build a Stage

Materials

- Wooden Blocks or other similar materials (cardboard, craft sticks, toothpicks, marshmallows, clay, and more; use anything around the house! Make sure all supplies are clean and safe to use).
- Paper and pencil

Ask and Research

1. What kind of mini stage would you like to build? Would it be for performing music, plays, a movie, or something else? Would it be inside or outside? Think about where it would be, what it would look like, how many people it could have, and any other questions you might have.

Design

2. Draw your stage! Think about what materials you have to build it and label each part on your drawing. Figure out how what would go where, and how much of each material you would need.

Create

3. Place Velcro on the sides of alternating blocks. If using different materials, cut out “blocks” or other shapes that you can use to create a mini stage.
4. Use your creativity to experiment with the blocks or other supplies and create structures.

Test and Revise

5. Look at your structure and see what you can add or change to make it even better!

Bubbles!

Materials

- Dawn™ dishwashing liquid soap
- Glycerin
- Water
- Tray
- hanger

1. Gently mix 2/3 cup (160 milliliters) liquid and 1 tablespoon (15 mL) glycerin (available at most drugstores) with 1 gallon (3.8 liters) of water.
2. Pour solution into a tray or other shallow container.
3. Create a bubble “device” using a wire coat hanger. You can also thread two straws through a sting or yarn and tie the end. The straws would be the handles.
4. Can you make different shapes? How big of a bubble can you make? Can you put one bubble into another? Explore your own ideas!

Printmaking with leaves, flowers, and plants

Materials

- Sponge or paint brush
- Paint (finger paint, tempura paint, or acrylic paint)
- Paper (construction paper works great)
- Paper Plates (for palette)
- Paper towels

1. Look at examples of printmaking art.
2. Collect leaves, plants, and flowers. Make sure they don’t have any water on them (dew, rain, etc.) Do you know what kind of plants they are?
3. Use a heavy book to make the plants flat before printing (about an hour).
4. Make palette of paint by adding a few colors to a paper plate. Use a paint brush or sponge to paint one side of the plant. Put only a thin coat on the plant (do not use too much paint).
5. Carefully, lay the plant down on construction paper, paint side down. Lay a paper towel over the plant and carefully press down. Remove the paper towel and plant. You’ve created art! Now, see how many plant prints you can make without adding more paint to the plant. What do you notice about the different prints?

Other STEAM resources:
https://www.exploratorium.edu/
https://www.sciencebuddies.org/