

TEACHER DIRECTED LESSON PLAN

LESSON 3: Brainstorming

LESSON OVERVIEW

This lesson, students will look at a variety of objects (both familiar and unfamiliar) in different ways. They will repurpose the objects by adding materials, subtracting from the designs, and thinking of different uses for the objects. This lesson is important in introducing students to brainstorming, thinking outside of the box, and using household items in different ways, skills which may help them in the creation of their own invention.

OBJECTIVE

Students will be able to describe and apply the brainstorming process. They will brainstorm and analyze and object and repurpose it, add to it and subtract from it.

MATERIALS

Resources For the Teacher:

- Slide Deck: Brainstorming (*optional*)
- Script: Understanding Design (*accompanies slide deck, optional*)
- Video: History Channel Time Out: *The Origin of Ice Cream Cone*
<https://www.youtube.com/watch?v=7OcfzMIZsxA> (2:56)
- Worksheet: SCAMPER with Ice Cream Cone
- Worksheet: SCAMPER On Your Own
- Worksheet: Ice Cream Cone Template
- Ice Cream Cone (or alternatively use a kitchen utensil or household object)
- Proving Behavior Activity (materials will be determined based on activity selected)
 - 💡 Gallery Walk- large sticky notes or white board space around the room, markers, various kitchen utensils or household objects, such as whisk, spatula, tongs, picture frame, hammer
 - 💡 Acrostic SCAMPER- large sticky notes or white board space around the room, markers, various kitchen utensils or household objects, such as whisk, spatula, tongs, picture frame, hammer

Materials For Students:

- Pens/pencils
- Notebook or paper
- Kitchen utensil or household object (*optional*)
- SCAMPER with Ice Cream Cone worksheet
- SCAMPER On Your Own worksheet
- Ice Cream Cone Template worksheet

INSTRUCTION & ACTIVITIES

Teacher may lead the following lesson plan with flexibility to adapt as needed to fit technology and class format:

Teacher Instruction:

1. *Teacher may use slides and script to explain Brainstorming or lead instruction and discussion on their own.*

Teacher will share Slide Deck- Brainstorming and use script as needed.

TIP: It is recommended that teacher establish guidelines and a safe space for class brainstorming session which are included in slide deck. Suggested ground rules to create a positive and open sharing space include:

- *Defer Judgement- accept all ideas without comment in first stage of brainstorming.*
- *Work for Quantity- all ideas should be recorded and allow ample time for everyone to contribute.*
- *Piggy-Back- encourage students to combine or improve ideas that may already be on the list.*
- *Freewheel- encourage crazy ideas. The most creative are often dismissed, but should be considered.*
- *Everyone Participates- all students should be involved in the brainstorming process.*

Depending on format of class, teacher may post a list of “Ground Rules for Brainstorming” where everyone can see them and review them throughout the invention unit.

2. Teacher will begin by asking if students know what it means to “brainstorm”. Allow students to share ideas. Brainstorming requires quick thinking and creativity. Many ideas are produced, but value judgements are avoided in a brainstorming process.
3. Teacher will tell students that brainstorming is an important step in the Invention Process- it is part of the “Ideate” and “Design” processes. Teacher will introduce the SCAMPER method of brainstorming. SCAMPER is one tool used to structure a brainstorming session. SCAMPER lists the kinds of thinking and doing cues that spark ideas. Discuss these strategies to guide the class through a brainstorm together. Teacher will present the vocabulary and help students by prompting them with the questions and suggestions for each letter of SCAMPER.
4. Teacher will share the video from the History Channel’s Time Out: *The Origin of Ice Cream Cone*. (Link: <https://www.youtube.com/watch?v=7OcfzMIZsxA>, 2:56 minutes. Video included in slide deck).
5. Teacher will then use the ice cream cone (alternatively, teacher may use a kitchen utensil or other object from home) as an example for doing a SCAMPER brainstorm together with the class. Teacher will show an ice cream cone and ask students to use the SCAMPER with Ice Cream Cone worksheet to follow along as the group SCAMPERS together. Teacher will read each letter of SCAMPER and then prompt students to consider questions in their approach to brainstorming.

Example: S= SUBSTITUTE

- What could be substituted for the cone?

- What could be substituted for the ice cream?
- What could be substituted for the taste? The texture?

After going through all of the letters of SCAMPER, ask students to discuss the ideas and select one new idea for using the ice cream cone. Teacher will finish the activity by telling students they have just completed a brainstorm. This method can now be used as they approach their own identified problems as they think of an invention to build.

6. Teacher will guide students to SCAMPER using a kitchen utensil or other household object of their choice using one of the Proving Behavior activities below. Teacher is encouraged to circulate around the class to prompt students with questions to help focus their brainstorming and to practice the SCAMPER method.

Student Proving Behaviors:

Recommendations for In-Class Learning (select one of the following):

1. Class SCAMPER: Teacher will lead entire class to brainstorm new ideas for a selected object. Teacher will prompt students to consider each letter of SCAMPER and record ideas for the group. Following the SCAMPER, teacher may lead class discussion.
2. Gallery Walk: Write each of the letters of SCAMPER on a large sticky note so you have seven sticky notes total. Place the notes around the room. Show the class a random object or utensil. Give each student a marker and ask them to go around the room and brainstorm new uses for the whisk as each letter prompts. When finished, ask students to come back together and look around to see the different ideas generated during the brainstorm. Discuss as a group.
3. Acrostic SCAMPER: Divide the class into groups of seven students each (adjust as needed based on number of students). Within each group, a student will be assigned to brainstorm a given object using one letter of SCAMPER, so that each letter will be brainstormed by at least one group member. After several minutes, ask the students to share their ideas with the rest of their group so that the object has been SCAMPERed entirely.

Ideas for Virtual Instruction:

1. Give students the Ice Cream Cone Template worksheet. Ask students to draw a new use for the ice cream cone by modifying the cone in the picture using SCAMPER and illustrating its new function. Students can submit work using the teacher's virtual platform of choice.
2. Ask students to think of a new use for an ice cream cone and to describe how the cone must be changed to serve the new function. Students can submit work using the teacher's virtual platform of choice.
3. Teachers may create a class gallery such as a blog or virtual sharing space where students can post their new ideas for the ice cream cone and make comments as they view the submissions by their peers.

Activity: SCAMPER ON YOUR OWN

This activity may be done in class or as a take-home assignment.

Students will need: Pen or pencil, Paper for taking notes and drawing, Kitchen utensil or other object (provided by teacher or brought from home, or if done as a take-home assignment, student can find an object at home.)

1. Teacher will distribute the SCAMPER On Your Own worksheet to students.
2. Teacher will guide students to SCAMPER using a kitchen utensil or other household object of their choice. Again, teacher will talk through each letter of SCAMPER and prompt with questions to help students focus their brainstorm for a new use for their objects. Teacher may choose to share their own example using a kitchen tool or household object.
3. Students will complete the SCAPER On Your Own worksheet as they do the activity.
4. At the end of the SCAMPER, students may share their new ideas with the class. Teacher may follow with a reflection about the brainstorm process. What was fun? What was challenging? What can students do when they feel “stuck” and they cannot think of anything?

Ideas for Virtual Instruction:

1. *Teacher may choose a specific object or allow students to choose from a list of 2-3 objects for their SCAMPER On Your Own activity. Students will then SCAMPER that object and complete the worksheet at home.*
2. *Teacher may choose to SCAMPER On Your Own as an entire class activity in a synchronous virtual session. Alternatively, teacher may show an object or several objects and then ask students to submit their brainstorm ideas using a virtual sharing tool.*
3. *Ask students to SCAMPER an object at home and then use other materials to re-design the original item into its new use. Students may then draw a picture or take a photo or video to share with the class using a blog, class meeting, or other virtual sharing tool.*
4. *Use a Zoom breakout room or Google Classrooms to allow small groups to virtually SCAMPER an object together. Bring groups back for a class share session.*

CHECK FOR UNDERSTANDING

Teacher may wish to do one of the following to check for understanding:

1. In the format of the teacher’s choice, ask students to share their independent brainstorming ideas in a class gallery and then ask students to comment on the submissions of their peers by offering one positive comment and one constructive idea.
2. In a pair-share, pair students and then ask them to swap one brainstormed idea for object from one of the activities done earlier in the class. Ask them to make one additional modification to the idea from their partner and then swap back to share their modifications.
3. Ask students to share how many ideas for a new use for the ice cream cone they came up with using the SCAMPER method. How might an inventor use this method and how might they use this activity in real life?