



Object Everyday

Lesson Overview

This lesson introduces students to the invention process, beginning with the identifying step. Students will brainstorm problems with objects they are familiar with, everyday items (pens, water bottles, staplers, etc). Students should share their ideas through class discussions. After a few items and discussions, students will choose one object to come up with a solution for and conduct user feedback interviews. Students can draw a model of their solutions and discuss them.

Lesson Objectives

Students will be able to:

- Identify and document problems students encounter with everyday objects.
- Begin identifying problems in their own lives.
- Document problems in their logbooks.

Materials

- A selection of everyday objects that students are familiar with and/or have used. Examples include water bottle, stapler, clothing, phone, etc.
- Space for brainstorming

Learning Plan

Classroom Lesson:

Introduction to Identifying (10 minutes)

Discuss what identifying problems means. Begin by asking students what they think it means. Give examples of what that looks like, including asking people in their lives about problems they encounter, reading or watching the news, talking to classmates, and documenting problems they discover in their logbooks.

Practice Identifying Problems (15 minutes)

Display an everyday object at the front of the room. Explain that you are going to practice identifying problems, starting with objects that many people use. Demonstrate by doing an example together as a class (for instance – ask what problems there are with a water bottle, which

Virtual considerations:

Objects

Teacher can show one object to the entire class on video.

Teacher can circulate students through breakout rooms to discuss different objects.

Students can choose objects from their house to either work on by themselves or to present to the class for them to brainstorm problems.

could be it leaks, is too flimsy, not dishwasher safe, etc.). Place a different everyday object at the front of the room and tell students that it's their turn to try identifying problems on their own. Give students 5 minutes to independently observe it and write down or draw the problems with it. Remind them that there aren't right or wrong answers.

Share (10-15 minutes)

Have each student find a partner or partners and ask them to share their lists with each other. You could have them keep track of which problems are on both lists and which ones are different. After sharing, have the pairs continue to generate problems.

Wrap-up (10-20 minutes)

Have groups share their problem lists with the class and record them for the class to see. Ask students if they have questions about identifying problems and reiterate that inventors need to start with this step before beginning to design and build an invention. Identifying problems first ensures that inventors are solving real problems.

Going further (time varies)

Perform this activity, using different objects, on multiple days. When finished, ask students to choose their favorite problem-solution and draw a model of what they think it could look like. Have students share their ideas with each other for feedback. Students should iterate on their designs after reflecting on the feedback.

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Discussions

Host whole class discussions on an online meeting platform or ask students to share their ideas through chat.

Use a virtual post-it notes board, such as Nearpod, Google Jamboard, Miro, Lucidchart, and Stormboard .

Drawing the solution

Students can draw their solution using Autodraw, Nearpod, Google Drawings, or Sketchpad.

Students can draw their solution on paper and take a picture to send to their teacher or present in a class meeting.

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Assessments
• Class brainstorm ideas • Group discussions • Self-assessment reflection • Lesson rubric

Content Standards

Next Generation Science Standards:

NGSS.3-5-ETS1-1

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

NGSS.MS-ETS1-1

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Science and Engineering Practice 1

Asking questions and defining problems.

Science and Engineering Practice 8

Obtaining, evaluating, and communicating information.

Common Core ELA Standards:

CCSS.ELA-Literacy.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.3.4

Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

CCSS.ELA-Literacy.SL.4.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.4.4

Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

CCSS.ELA-Literacy.SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.5.4

Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

CCSS.ELA-Literacy.SL.6.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.4

Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-Literacy.SL.7.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.7.4

Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-Literacy.SL.8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.4

Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-Literacy.L.3.1

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

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CCSS.ELA-Literacy.L.8.1

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CCSS.ELA-Literacy.W.3.10

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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CCSS.ELA-Literacy.WHST.6-8.10

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