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K-2

SEL& Engineering

Prep time: ~15 mins
Lesson: ~40-60 mins

Pulley-Powered Light Bulb Hat

SEL & Engineering Task

In this lesson, students reflect on how they feel when people respond positively to their ideas. They learn different phrases to celebrate their peers' ideas and have a chance to practice being supportive. Students confront a design challenge: how do I make this lightbulb raise up without touching the lightbulb with my hands?

Materials:

1. Anchor chart paper
2. Copy paper for printable
3. Coloring materials
4. Card stock paper
5. Paperclips
6. Stiff paper straws (or bendy straws)
7. Thin string or ribbon
8. Tape
9. Scissors
10. Stapler

Prep:

1. Print 1 printable sheet per student
2. Set up materials available for each student/table group
3. Make your own light bulb imagination hat in advance

Step-by-step: SEL

1. Ask students to imagine they have a great idea. How would they feel? Today they will read a book about a child with a lot of ideas!
2. Read Mazie's Amazing Machine aloud. Stop to reflect on moments her family responds to her ideas
   - (p. 9 (Doodle), p. 12 and 13 (Mom and Jake). p. 15 (Dad), p. 24 (Jake)
3. Reflect with students about times they have used their imagination to solve a problem. Did anyone say anything to them?
4. Brainstorm on anchor chart: How can we show people we appreciate their ideas?
   - "That's a great idea!" "That's a cool way to think about it." The thumbs up sign, a big smile
5. Show students a model lightbulb. Explain that, like Mazie, they will make their own lightbulb to turn their imaginations on.
6. Students work independently coloring lightbulbs and cutting them out.
7. Meet back on carpet, everyone holding their lightbulb

8. Show students a paperclip and a piece of string/ribbon. What could these be used for? Think, blink! Practice turning to a partner and using positive responses when they share an idea.

9. Reflect with students: how does it feel when someone responds to an idea with kind words?

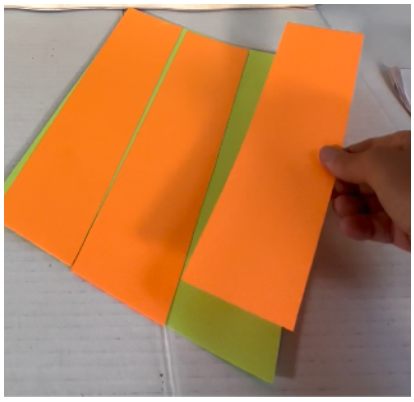
Please note: For the Engineering Task, the step-by-step instructions will lead students to make a pulley on their imagination hats that will raise the lightbulb. Depending on the age of your students and your class experience with Engineering Tasks, you may consider less guidance to allow more space for independent problem solving. I recommend making your own lightbulb hat in advance to ensure you can help students problem solve.

Step-by-step: Engineering Task

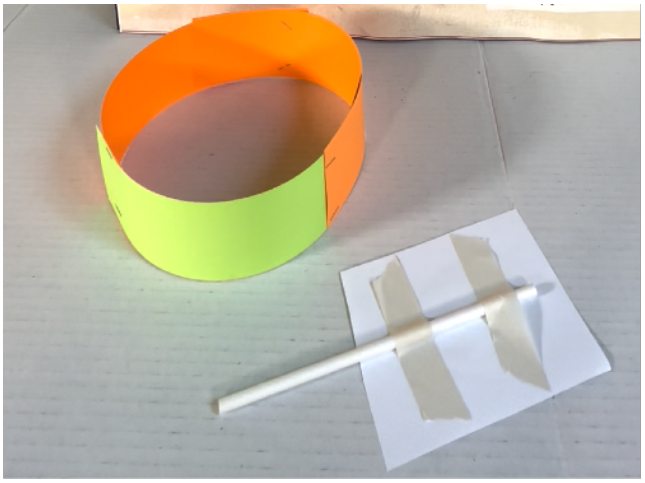
1. Present the engineering challenge: holding up your own decorated light bulb and paper strip hat and ask students:
    - "How could I raise the lightbulb from horizontal to vertical without touching it with my hands?"
2. Provide think time for students. Remind students to practice positive responses, and have students share their ideas with a partner.
3. Explain to students that today they will have a chance to design a pulley similar to the one Mazie used to help solve her dog food problem.
4. Show students the materials with which they will be working. Remind them about responsible use of materials.
    1. At this point, choose to execute the below instructions, or permit students to explore the materials and confront the design challenge independently or in groups.

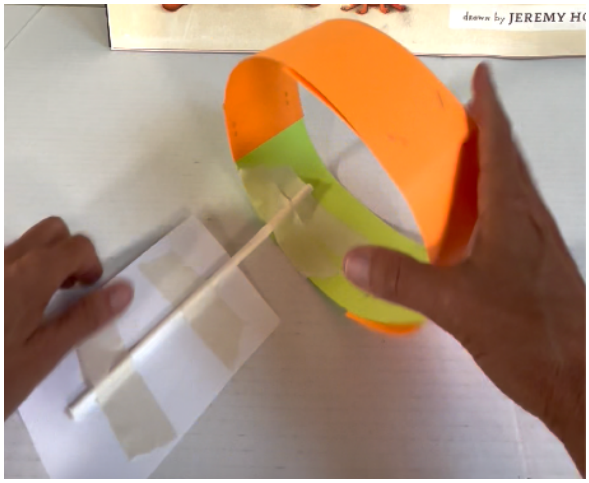
5. Color lightbulb and and cut out light bulb or cut along rectangular lines

6. Cut card stock into 3 long strips. Staple or tape strips together to make a hat that snugly fits head.



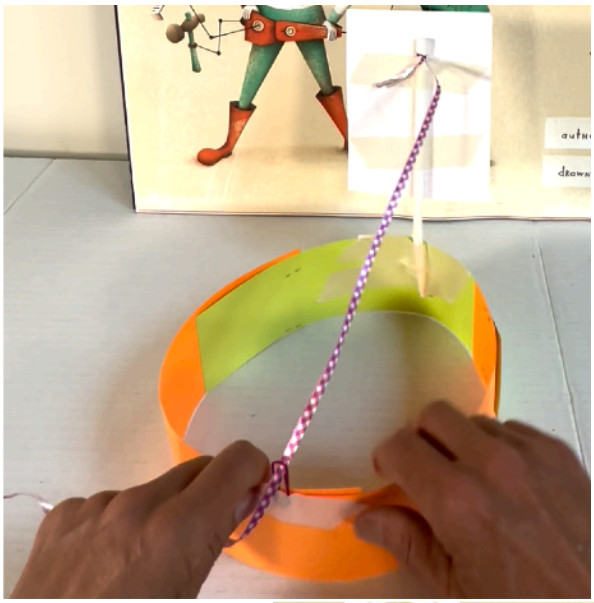
7. Tape stiff straw securely to back of light bulb. 8. Then tape bottom of straw to inside of hat.





9. Bend straw just above top of hat. 10. Tie or tape approx. 24" of string to top of straw.

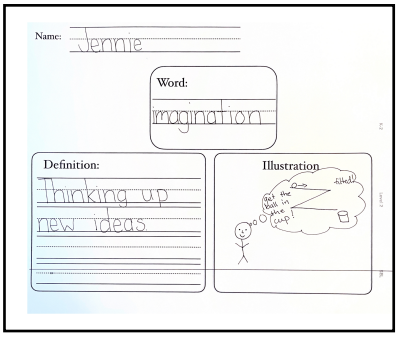
11. Fasten and tape paper clip at back of crown and thread string through clip.



12. Wear your Imagination Hat and pull string to make your light bulb pop up!

13. Color, cut out and tape Invention Idea Bubble, Gear and Question Mark to hat.

14. When students are wearing their imagination hats, tell them to drape the length of string over their shoulder so it is easy for them to grasp and pull
15. Students meet back on the carpet wearing their imagination hats. They can reflect on their engineering process, how they responded to ideas, and things they might do better next time.
    - What was difficult about the task?
    - What came easily to you?
    - Who noticed other engineers using positive language? Can you give me some examples?
    - Turn and Talk: explain to your partner how it is possible that the lightbulb lifts without a person touching it.
16. Teacher might point out that s/he heard some of the phrases on the anchor chart, which helped keep the learning space positive and friendly.

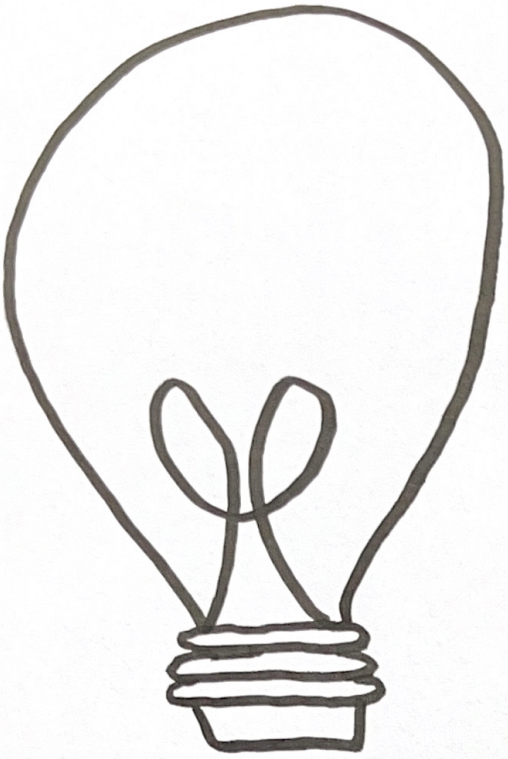


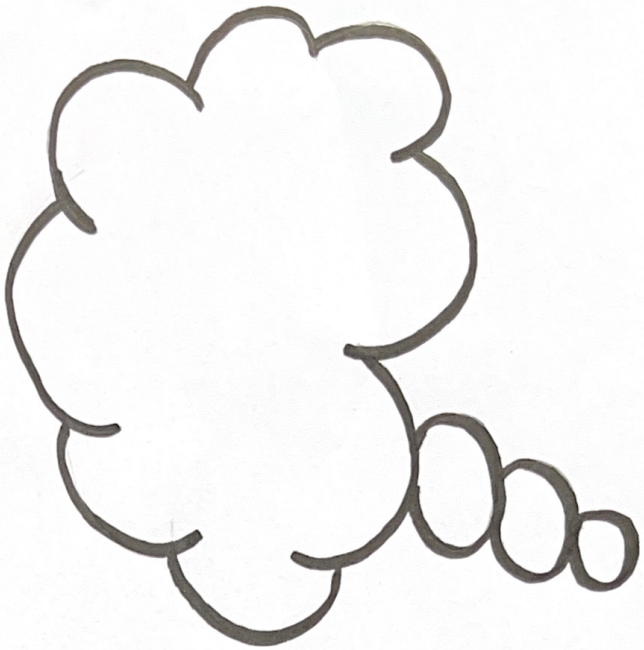
Enhancements and Modifications

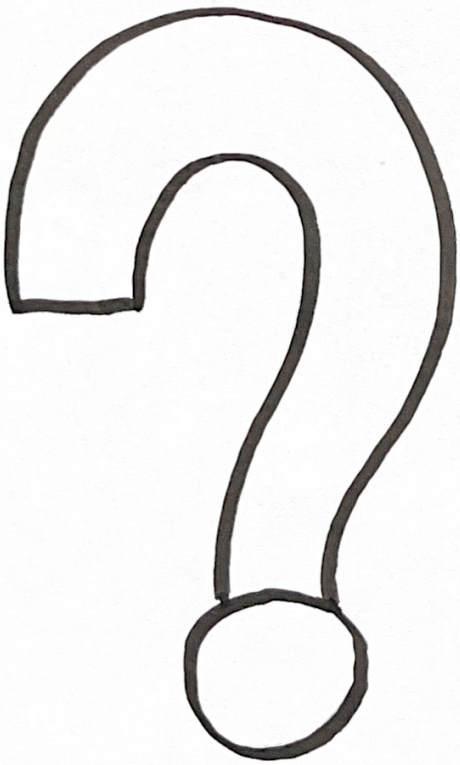
1. Vocabulary enhancement/ELL support: explicitly teach a vocabulary word through quick vocabulary mapping (attached), American Sign Language (handspeak.com), or Morning Meeting.
    - Imagination: thinking up new ideas
    - Engineer: a person who solves problems
    - Pulley: a simple machine that helps lift things
2. Early finishers?
    - Explain that early finishers in the SEL portion can decorate the rest of their hat.
    - Explain that early finishers can support other students with questions.

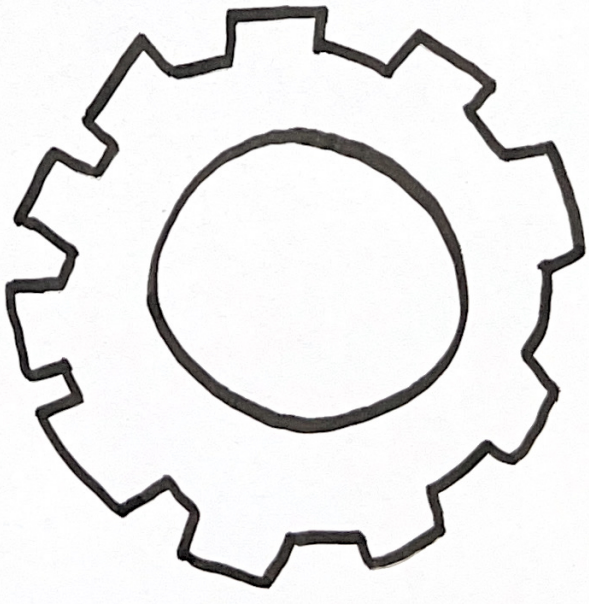
Additional Teacher Guidance

1. Lightbulbs can be colored in a traditional yellow, but if you don't have a lot of yellow crayons, show students they can decorate in a variety of ways—representing their individual ideas!
2. Freeform tasks can be frustrating for some students. Consider these prompts for students during the Engineering Task:
    1. What if you use [material]?
    2. Have you thought about...?
    3. [Child] had an interesting idea. Why don't you ask them for their thoughts?
3. Imagination hats can be used during the brainstorming part of any future lesson, from STEAM to writing
4. Consider reading the book multiple times to help support student understanding.









Name: _____

Word:

Definition:

Illustration

Standards Alignment

Kindergarten

CCSS.ELA-LITERACY.RL.K.1 With prompting and support, ask and answer questions about key details in a text.

CCSS.ELA-LITERACY.SL.K.6 Speak audibly and express thoughts, feelings, and ideas clearly.

CCSS.ELA-LITERACY.L.K.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts.

CCSS.ELA-LITERACY.SL.K.1.A Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

First Grade

CCSS.ELA-LITERACY.RL.1.1 Ask and answer questions about key details in a text.

CCSS.ELA-LITERACY.SL.1.4 Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.

CCSS.ELA-LITERACY.L.K.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts.

CCSS.ELA-LITERACY.L.1.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., because).

CCSS.ELA-LITERACY.SL.1.1.A Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.1.6 Produce complete sentences when appropriate to task and situation.

Second Grade

CCSS.ELA-LITERACCCSS.ELA-LITERACY.SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

CCSS.ELA-LITERACY.SL.2.3 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

CCSS.ELA-LITERACY.SL.2.6 Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

K-2 Next Generation Science Standards (NGSS)

K-2-ETS1-1 Engineering Design Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2 SEL Competencies

Social Awareness: Leaning into others' perspectives with curiosity; recognizing and acknowledging the inherent strengths in others; demonstrating empathy and compassion; showing concern for the feelings of others. Relationship Skills: Listening actively, communicating effectively, and self-advocating; making and maintaining trusting, respectful friendships; practicing collaborative problem-solving focused on the common good.