

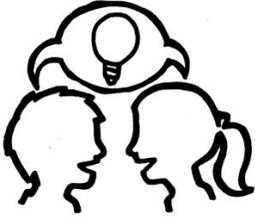
What is Engineering? Tools of the Trade



Overview: In this activity, kids will learn that engineers design and improve technologies for their jobs.

Note to Educator: Engineering can be a scary word for those who are not familiar with it. Engineers are really just people who use science, math, and creativity to solve problems. The main job of an engineer is to design and improve technologies, not to repair or build technologies.

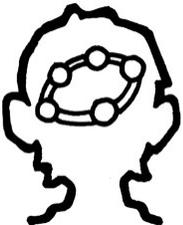
Set the Stage (5 min)



Activity (30 min)



Reflect (10 min)



Materials

For the whole group:

- Engineering Design Process poster
- Tools of the Trade*, printed on card stock, pp. 4–5
- Problems Page, p. 3
- large space to run in, outdoors or indoors
- tape or chalk for marking boundary lines

For each kid:

- Engineering Journal

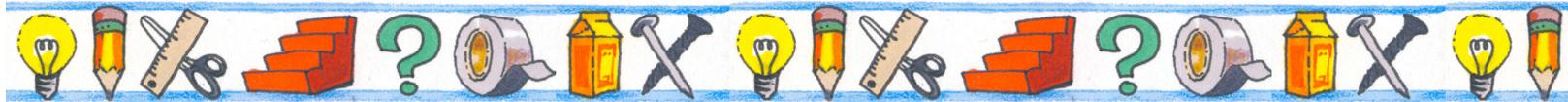
Preparation

Time Required: 5 minutes

1. Copy *Tools of the Trade* onto card stock.
2. Use tape or chalk to create a large playing space that looks like this:

Team 1	Middle Line	Team 2
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Kids will learn:

- Engineers use the Engineering Design Process as a tool.
- Engineers help solve all kinds of problems.



Set the Stage (5 min)

1. Review the concept of technology with kids. Ask:
 - **What is a technology?** *A technology is anything designed by people to help solve a problem.*
 - **Who designs technologies?** *Engineers.*
 - **How do you think engineers design technologies to solve problems?** *Engineers use a tool called the Engineering Design Process to help them solve problems.*
 - **What types of problems do you think engineers solve?** *Accept all responses. Tell kids that they will play a game that will help them answer this question.*



Play Tools of the Trade (30 min)

1. Divide kids into two teams. Have each team number off. Place the *Tools of the Trade* images on the Middle Line. Have each team stand at opposite ends of the playing area.
2. Read a problem from the Problems page.
3. Give kids 5-10 seconds to decide, as a team, if an engineer would solve the problem.
4. Call off a number.
5. The two kids with that number will race each other to see who can grab the appropriate tool first. If kids think an engineer would solve the problem, they should grab the Engineering Design Process picture. If kids think someone else would solve the problem, they should grab the Tools picture.
6. After grabbing the picture, kids try to run to their team before being tagged!
7. Announce the correct answer. Points are awarded to the team that both chooses the correct picture and makes it back without getting tagged.

Tip: Have one or two kids keep track of the score and which problems are solved by engineers.



Reflect (10 min)

1. Gather kids together to reflect. Ask:
 - **What types of problems do engineers solve?** *Engineers solve problems that relate to designing or improving technologies. An Engineer's job is not to fix things that are broken.*
 - **What tool do engineers use to help them solve problems?** *The Engineering Design Process.*
2. Tell kids that they will use the Engineering Design Process themselves as they move through the unit! Give kids time to record their thoughts in their Engineering Journals.

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Read scenarios from the following lists as you play Tools of the Trade.

Engineers

1. It is raining outside and I'm wet! I need someone to design something that will keep me dry.
2. I am building a really tall building. I need someone to tell me how high I can build it without making it dangerous.
3. My spoon gets too hot when I eat soup with it. I need someone to invent a better spoon!
4. Oh no! The water in the lake is dirty, and the animals in the lake look sick. I need someone to develop a way to clean the lake to protect the animals that live in it.
5. Oops. I dropped my goggles in the ocean and they sank to the bottom. I need someone to design something that will get them for me.
6. I am building a bridge. I need someone to test the ground to figure out the best place to build the bridge.
7. I am mailing apples to my teacher. Can someone design a package that will protect my apples while they are in the mail?
8. Everytime I try to read outside, the pages blow around and I cannot keep my place. I need someone to invent a different kind of book so I can read outside.
9. My computer is really big and heavy. I need someone to design a computer that is easy to carry around.
10. I am sad because sometimes animals get hurt when they try to cross roads. I need someone to design a new way to build roads so that animals will not get hurt when crossing them.

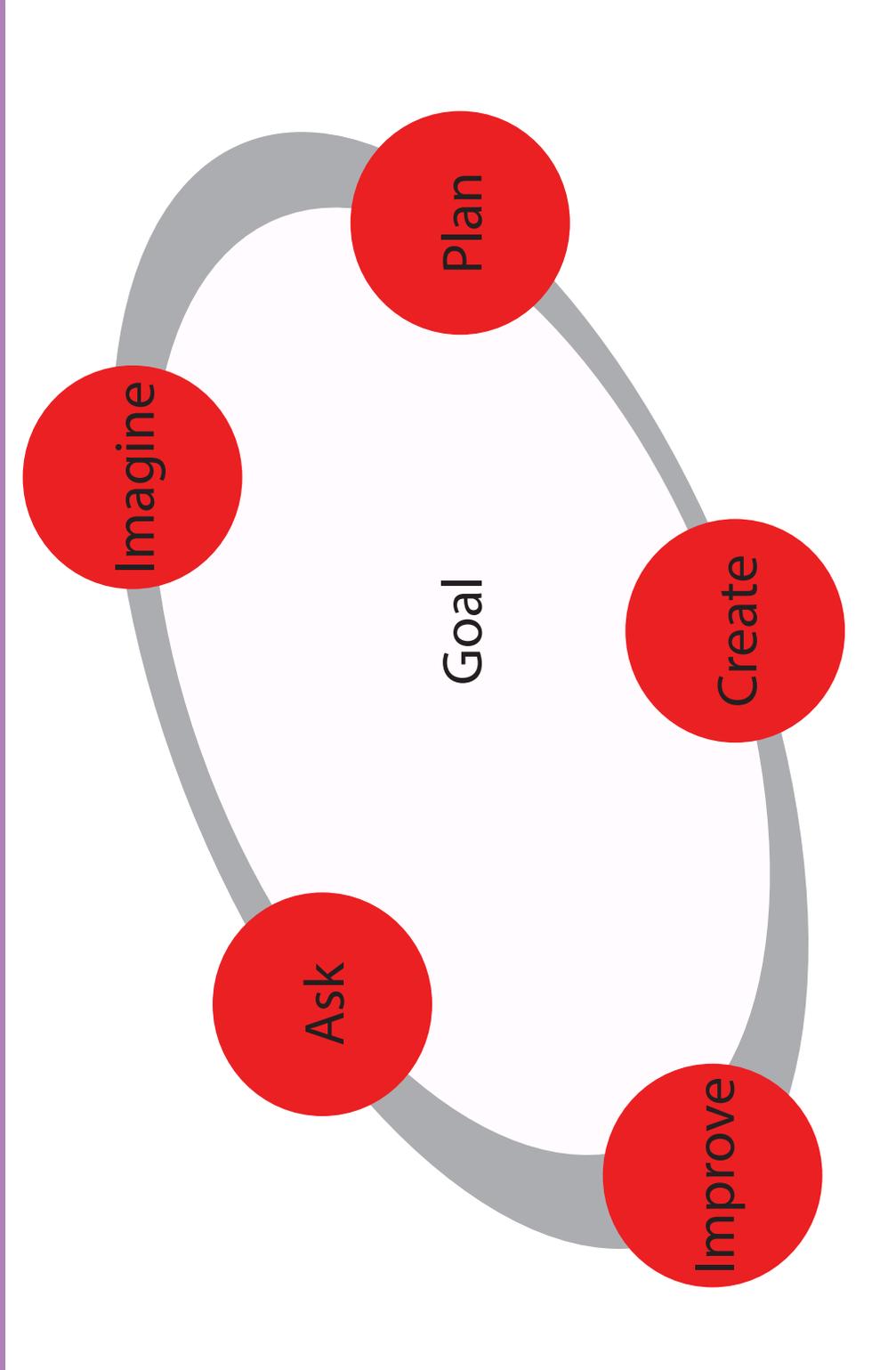
Other

1. My house is on fire! I need someone to put it out!
2. My TV is not working. I need someone who knows how to fix it.
3. My computer is so confusing! I need someone who knows a lot about computers to show me how to use it.
4. My car has a flat tire. I need someone who knows how to replace it.
5. Oh no! My cell phone is broken! I need someone who can repair it!
6. I live in the middle of a forest, and no one comes to visit me because I have no road. I need someone to build a road for me to drive on.
7. I have a digital clock, but something is wrong with its wiring. Can someone figure out how to fix it?
8. I live in a city that is far away from a train station. I need someone to lay train tracks that lead to my city!
9. I am fixing my roof and I need someone who knows how to work with wood to help me.
10. I live next to a river. On the other side of the river is a candy store! I need someone to build a bridge for me to use so I can cross the river and get to the candy store.

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The Engineering Design Process



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Tools

