Prep Adventure   **Educator Page: Preview**
# What is Engineering? Tower Power Returns

Overview: Kids will engineer and build a tower out of paper cups and construction paper that will support a stuffed animal.

Note to Educator: Who are engineers? Engineers are people who use science, math, and creativity to solve problems. Today kids will be engineers as they use the Engineering Design Process to design towers.
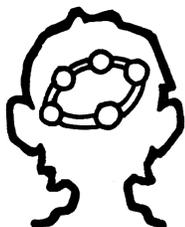
Duo Update (5 min)
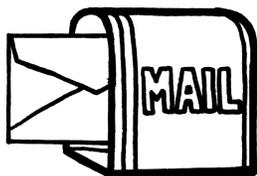
Set the Stage (5 min)

Activity (30 min)

Reflect (5 min)

Materials

For the entire group:
- ☐ *Message from the Duo*, p. 5
- ☐ EDP Poster
- ☐ *Building with Cups,* p. 7
- ☐ *Building with Construction Paper*, p. 9
- ☐ timer or clock
- ☐ 1 small stuffed animal

For each group of 3-5 kids:
- ☐ 20 small paper cups
- ☐ 2 sheets of contruction paper
- ☐ At least 1 foot of masking tape
- ☐ 1 ruler
- ☐ 1 pair of scissors

For each kid:
- ☐ *Reflect Page,* p. 11

Preparation

Time Required: 10 minutes
1. Have the *Message from the Duo* ready to share.
2. Make samples of the items found on *Building with Cups* and *Building with Construction Paper.*
3. Copy one *Reflect Page* for each kid.

Prep Adventure   Educator Page: Adventure Guide
What is Engineering? Tower Power Returns

Kids will learn:
- the Engineering Design Process is a tool they can use to help solve problems.

Present the Message From the Duo (5 min)
1. Tell kids that India and Jacob are a brother and sister who travel the world. They find problems and solve them using engineering.
2. Today, India and Jacob sent us a message about a problem they'd like us to solve. Have kids read the *Message from the Duo* for more details.

Set the Stage (5 min)
1. Tell kids that today they are going be engineers and use the Engineering Design Process to solve India and Jacob's problem. To check for understanding, ask:
   - **What do India and Jacob need us to engineer?** *A tower to lift the animal up 10 inches so it doesn't get eaten by alligators.*
2. Show groups the Engineering Design Process poster and tell them they are going to Ask questions about the problem, Imagine ways to solve it, Plan a design, Create and test it, and then think about ways to Improve it.

Imagine (5 min)
1. Tell kids it's time to look at the materials they can use and Imagine different ways to make them work.
2. Split kids in groups of 3-5 and give each group 20 paper cups, 2 sheets of construction paper, scissors, and tape. Ask:
   - **Can you Imagine any ways you could use these materials to engineer a tower?**
3. If your kids want to see examples, show them the samples you prepared, or have them look at *Building with Cups* and *Building with Construction Paper*. Ask:
   - **Do you think any of these ideas might work well? Why?**

Plan and Create (at least 20 min)
1. Tell kids it is time to plan and create their towers.
2. Show the stuffed animal and explain that:
   - The challenge is to work in groups to engineer a tower that can hold the animal 10 inches in the air for at least 10 seconds.
   - Each group will have (at least) 20 minutes.
   - You can only use the cups, paper, and tape in the tower. The scissors are a tool only and

Tip: If you can, you may want to offer more time for this challenge.

cannot be used in the tower.

- You can hold the stuffed animal briefly, but you can't test it on your tower until the 20 minutes are up.

3. As groups work, circulate around the room. Ask questions like:
   - **Why do you think your design will work well?**
   - **Which step of the Engineering Design Process are you using right now? How do you know?**

Tower Showcase (10 min)

1. Have each group present their tower. Ask each group questions like:
   - **Can you tell me about your design?**
   - **Which steps of the Engineering Design Process did your group use?**
2. Use a ruler to measure the tower. Give one kid the stuffed animal and have him or her place it on top of the tower. Count to 10 and observe what happens. Ask:
   - **What parts would you Improve if you could design your tower again? Why?**
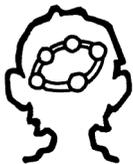
Reflect (5 min)

1. Go through the Engineering Design Process poster with kids and have them talk about how they used each step to solve the problem. Ask questions like:
   - **How did you use this step of the Engineering Design Process to solve the problem?** *We Asked about the challenge; we Imagined ways to build with the materials; we Planned when we decided what design to use; we Created and Improved when we built and fixed the tower.*
   - **Why do you think it's important to use these steps?** *It helps us keep track of our ideas and make sure we're meeting our goal.*
   - **Do you think you are an engineer?**
2. Tell kids that they've just used the same steps that engineers use to solve problems. This means that they are engineers, too! Tell kids they will have the opportunity to engineer solutions to even bigger problems with India and Jacob later on.
3. Give kids time to record their thoughts on the *Reflect Page*.

| reply | forward | archive | ✗ delete |

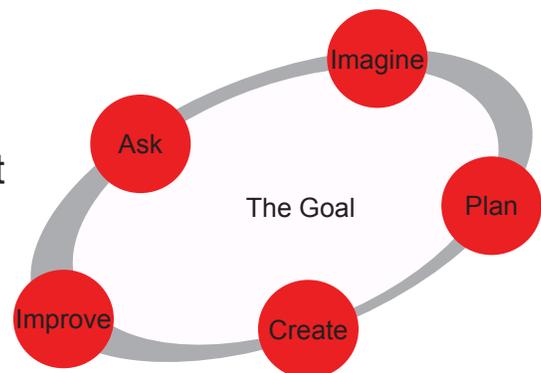| from	engineeringadventures@mos.org
subject	Engineering a Tower
to	You
	10:36 AM

Hi everyone,

We're so excited to meet you! Our names are India and Jacob. We do a lot of traveling all over the world. We meet interesting people and see some amazing countries. Each place is unique, but we've found one thing in common. Everywhere we go in the world, we find problems that can be solved by engineers.

Engineers are problem solvers. They're people who design things that make our lives better, easier, and more fun! We heard you might be able to help us engineer solutions to some of the problems we find. That means you'll be engineers, too!

Today, we came across an engineering challenge we think you can help us solve. There are some animals living in a swamp along with lots of hungry alligators. The animals need to be at least 10 inches above the alligators to be out of their reach. India and I thought we could build a tall tower that the animals could stand on. Do you think you can engineer a tower for us?

We sent you one tool that we usually find really helpful when we're trying to engineer a solution to a problem. It's called the Engineering Design Process. Take a look at it and see if it can help you!
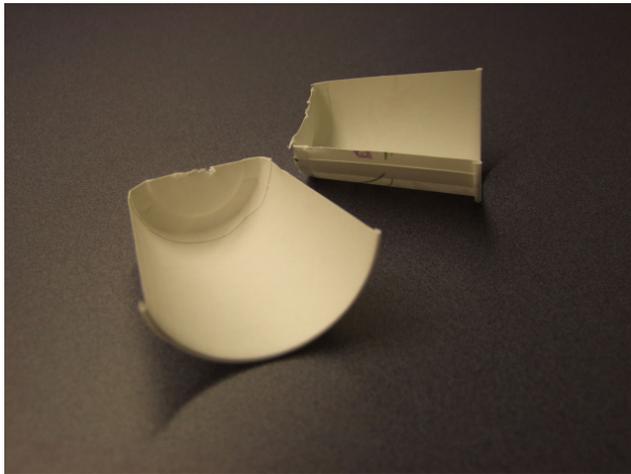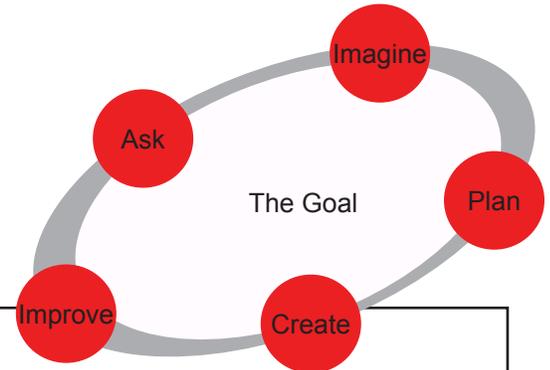
Good luck!
India and Jacob

Ask
Imagine
Plan
Create
Improve
The Goal

Here are three ways to build with cups.

The Goal

Ask · Imagine · Plan · Create · Improve

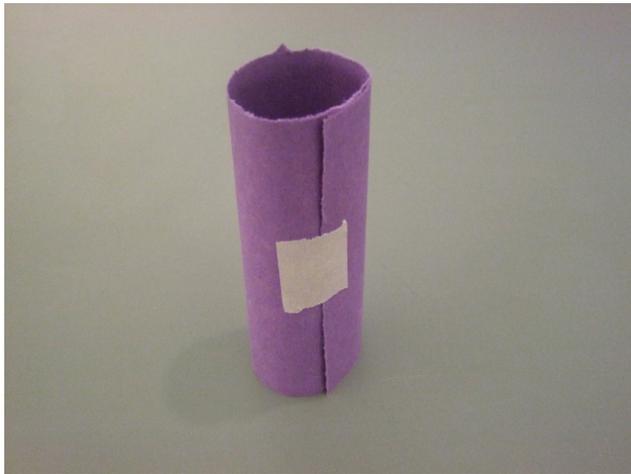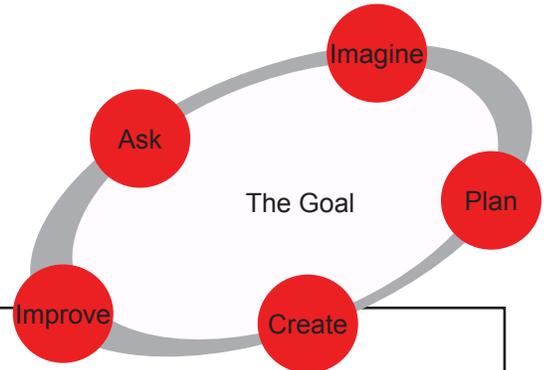Slice it!

Flatten it!

Octopus it!

Will any of these ideas help your group build a tower? What other ideas do you have?
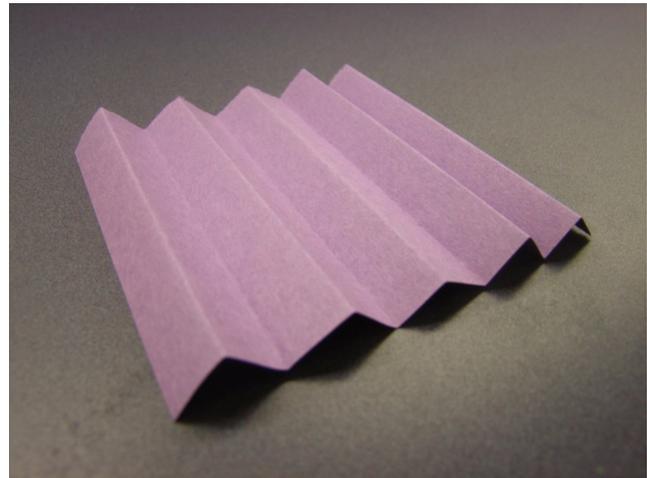
Talk with your group to figure it out!

Here are three ways to build with construction paper.

Imagine

Ask

The Goal

Plan

Improve

Create

Roll it!

Fan it!

Fold it!

Will any of these ideas help your group build a tower? What other ideas do you have?

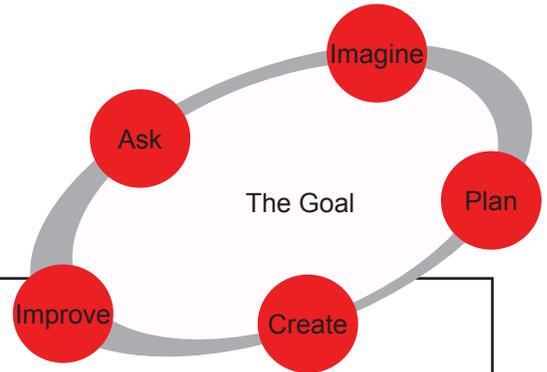Talk with your group to figure it out!

Draw Your Tower

Use the space below to draw a picture of your tower.

The Goal

Imagine

Ask

Plan

Improve

Create

What parts of your tower design would you change if you could do it again?

For the Record

I think engineering is:

☐   Fun

☐   Exciting

☐   Difficult

☐   _____