ENGINEERING DESIGN

TOWER BUILD

A SCIENCE @ HOME ACTIVITY

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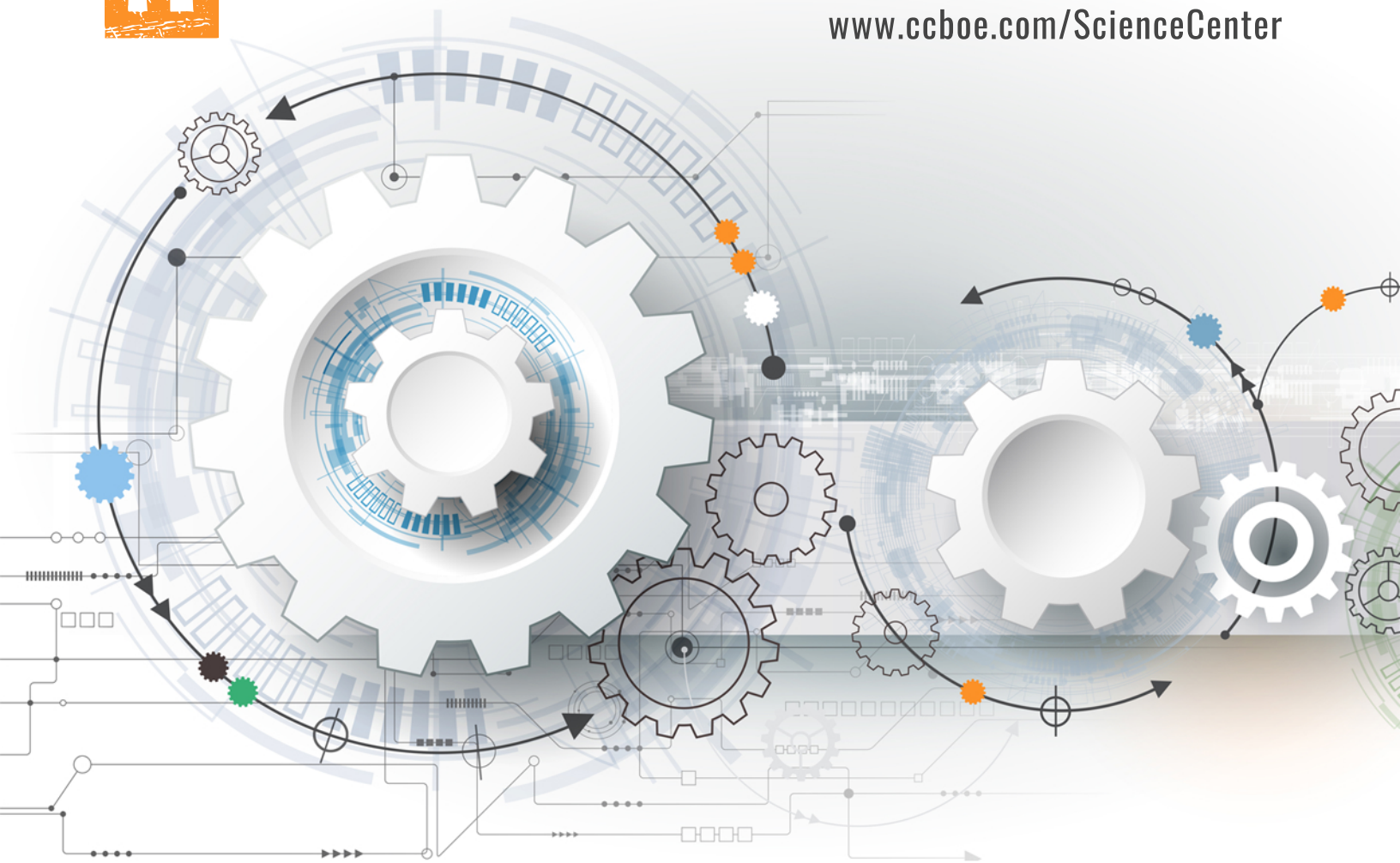


LESSON OVERVIEW FOR PARENTS

Directions: Tower Challenge

This lesson will focus on activities designed to generate interest and understanding of scientific principals and the scientific process for your students. Suggestion to increase student success:

DEMONSTRATE A POSITIVE ATTITUDE ABOUT LEARNING

What we say and do regarding learning will help them to develop positive attitudes toward learning and to build confidence in themselves as learners. Ask questions about what they are doing, what they have learned, what they liked and didn't like about the activity and tell them about how learning has helped you as an adult.

In addition, by showing interest in their children's education, parents and families will spark enthusiasm which will help them to understand, that learning can be enjoyable as well as rewarding and is well worth the required effort.

ENCOURAGE YOUR CHILD TO BE RESPONSIBLE AND WORK INDEPENDENTLY

This is sometimes hard as your child struggles with a concept. However, we often learn more from our struggles than our successes. Monitor the situation and give minimum guidance, so your child will ultimately be successful and not become frustrated. It may be helpful (necessary) to show your child how to break a task down into small steps, so they do not become overwhelmed.

ENCOURAGE ACTIVE (HANDS-ON) LEARNING

All of us learn in multiple ways. Some by reading, some by hearing, some by seeing and some by doing. However, most successful learning and remembering occurs when we use a combination of styles. Active learning involves asking and answering questions, solving problems and exploring your child's interests. To promote active learning, listen to your child's ideas and respond to them with encouraging questions and opinions.

As you work with your student scientist , remember, you are your child's first and most important teacher.

If you do not have the materials that are suggested on the materials list, your student can experiment with other substitute materials. Please make sure that you are monitoring the selection and use of any materials.

ENGINEERING CHALLENGE

How tall can you construct a tower?

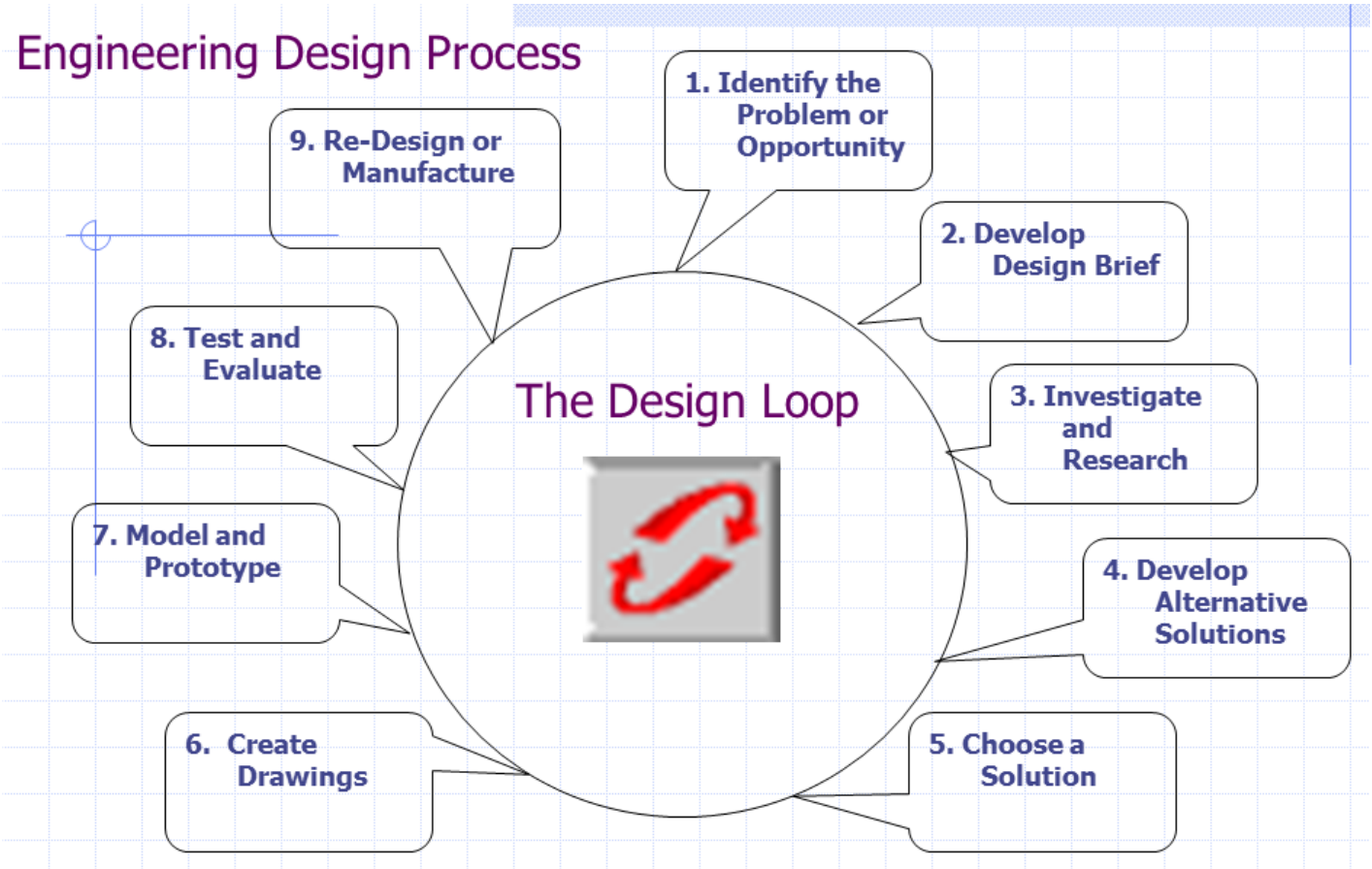
This is both a personal challenge and a fun family competition.

PURPOSE

Engineering challenges are a fun and educational activity to solve a stated task. There is not a single solution or one correct answer for each specific challenge. Rather you are encouraged to try alternative solutions and use the Engineering Design process to meet each challenge for the optimal result.

ENGINEERING DESIGN PROCESS

The **engineering design process** is a series of **steps** that engineers follow to come up with one possible solution to a problem. Often the solution involves **designing** a solution that accomplishes a certain task and/or meets certain criteria. However, one very important aspect of the design process, is the feedback loop. This is used to look at outcomes and then make adjustments to develop a solution that is more successful at meeting the task.



CHALLENGE

To build a tower using common playing cards and make it as tall as possible, following various constraints.

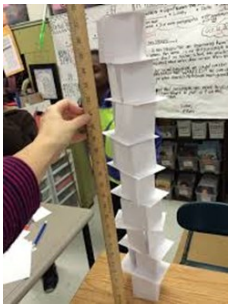
MATERIALS

- Deck of regular playing cards – 52 cards
- You may also use Uno or Old Maid cards, etc
- Tape Measure
- Timing device
- Camera

RULES

- You may only use the 52 regular playing cards
- You may not bend or fold the individual cards
- You may not use glue, tape or any type of material to hold the cards in place

PROCEDURES



1. Using all 52 cards see how tall you can construct your tower.
2. Once you are done, measure the overall height.
3. Now challenge other family members to try and build a taller structure.

MODIFICATIONS

- Set a time limit and see how tall a tower you can build in a specific time.
- Now challenge other family members using the same time frame.
- Deal the cards to all participating family members and take turns placing the next card and see how tall a structure you can construct as a team.

FOLLOW-UP

Post a picture of your designs by tagging us at James E. Richmond Science Center on Facebook and Twitter. Let us know who had the best design and what made it the best. If you learned something as you went through the design process, what did you learn. Post a picture or send to a friend with the height measurement and challenge them to build a taller structure and send you a picture.