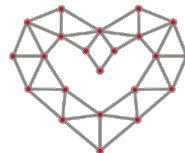


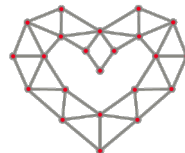
EEK!

ENGINEERING
IT
ENGAGEMENT



CELL-MET

LAB COLLAB



CELL-MET

Objective:

Play a timed game to
learn about
engineering skills

In this slide show, you will

1. Learn about engineering skills
2. Get instructions on playing the game
3. Play the game!

ENGINEERING SKILLS

Engineers often work on really difficult problems.

Engineers often work on really difficult problems.

There are 3 skills that help them succeed

3 skills that help engineers

Creativity

Teamwork

Hard work

WHY DO YOU THINK THESE SKILLS ARE
IMPORTANT?

EEK! 

This game was created to help you figure it out.

So, let's set up!

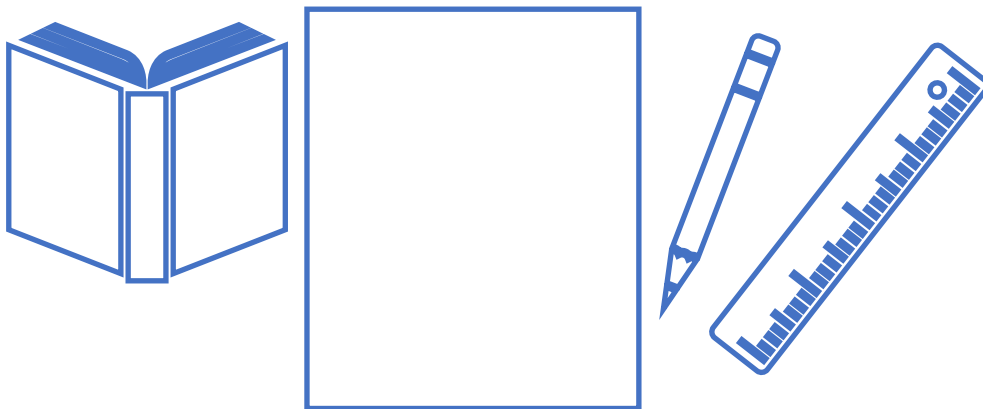
EEK! 

GAME SET UP

EEK! 

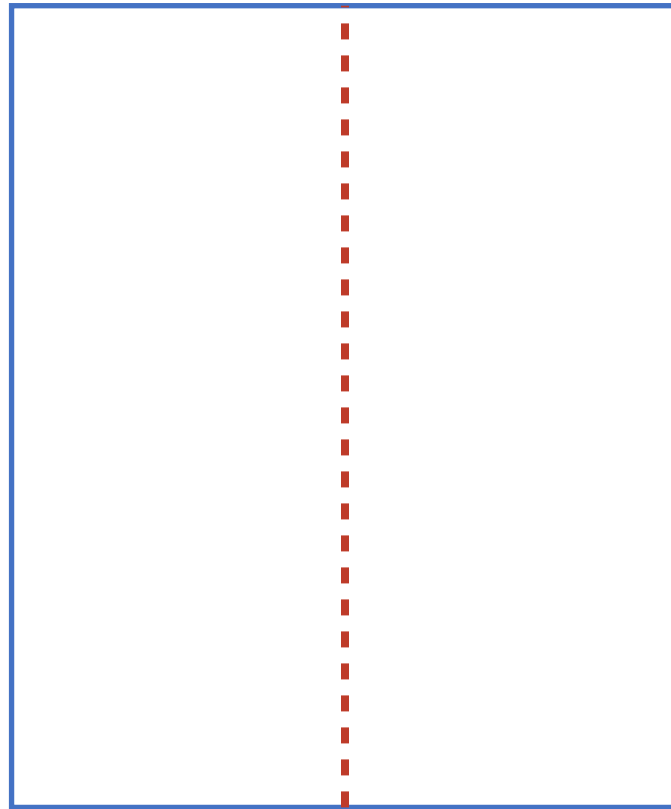
For this game, you need

- A large flat surface (table or floor)
- Coins: 1 penny, 1 nickel, 1 dime, 1 quarter
- 1 sheet of paper
- 1 pencil
- Something to help you draw straight lines
 - Such as a ruler or book



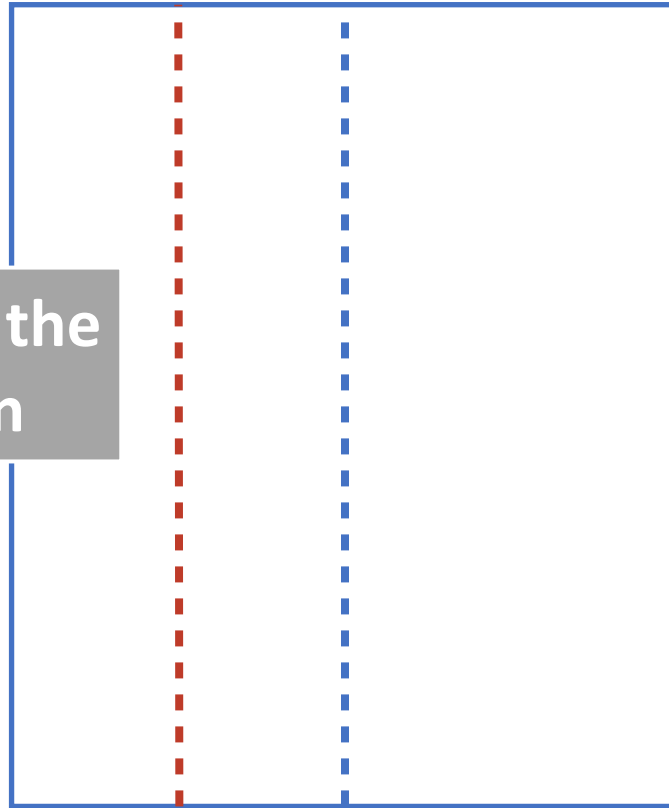
1. Draw your columns

1. Draw a line down the center of your paper



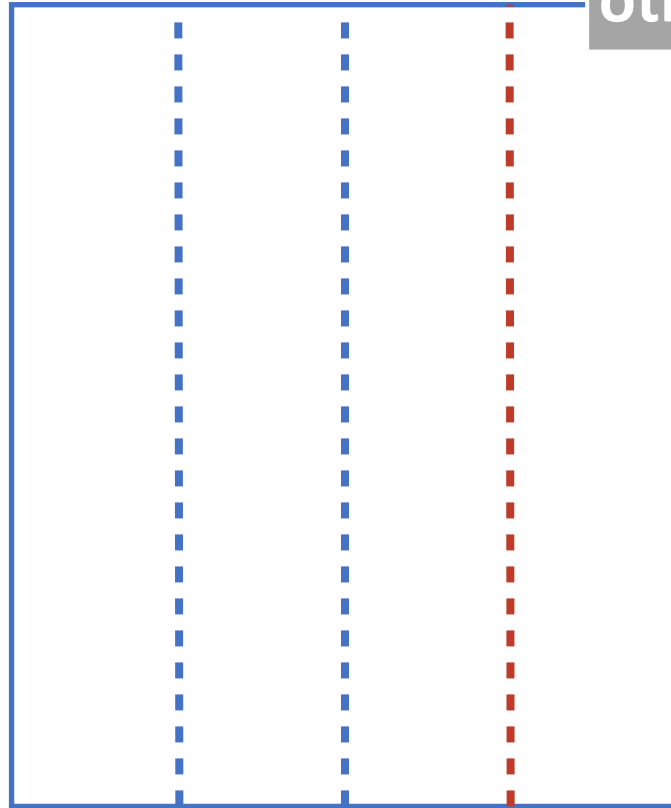
1. Draw your columns

2. Now, draw a line down the center of your first column



1. Draw your columns

3. Repeat on the other side



1. Draw your columns

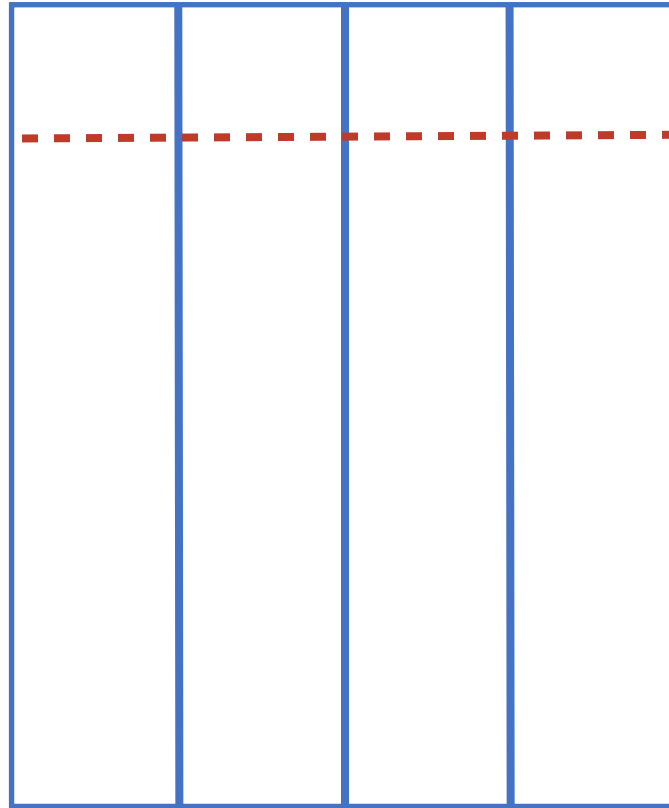
You now have 4
columns

--	--	--	--

2. Draw a header row

1. Draw a line across the top of your paper

This does not need to be too big— just large enough to write labels in



2. Draw your rows

2. Add a label for each of your coins

\$0.01	\$0.05	\$0.10	\$0.25

I used each coin's value but you can write it's name instead if you'd like (penny, nickel, dime, quarter)

2. Draw your rows

3. Draw a line to divide the remaining space in half

\$0.01	\$0.05	\$0.10	\$0.25

2. Draw your rows

3. Draw a line to divide the remaining space in half

\$0.01	\$0.05	\$0.10	\$0.25

ROUND 1

There are 2 rounds for this game

ROUND 2

EEK! 

You are all set up.

**Now its time to learn the
rules!**

EEK! 

LEARN THE ACTIVITY

EEK! 

In this activity, you are an engineer trying to build heart tissue. You have 4 tasks to accomplish to succeed.

Each task is represented by a different coin.

First, let's review the tasks...

EEK! 

The 4 Tasks

1. **3D Print a structure** for heart tissue to grow in
2. **Grow heart tissue** inside the structure
3. **Make glue** to attach the tissue to the heart
4. **Teach the heart tissue to beat** with the rest of the heart

The 4 Tasks

1. **3D Print a structure** for heart tissue to grow in

Heart tissue needs a shape to guide it – like how ice cube trays shape ice.

2. **Grow heart tissue** inside the structure
3. **Make glue** to attach the tissue to the heart
4. **Teach the heart tissue to beat** with the rest of the heart

The 4 Tasks

1. **3D Print a structure** for heart tissue to grow in
2. **Grow heart tissue** inside the structure
Heart tissue needs food and care to grow healthy – just like people.
3. **Make glue** to attach the tissue to the heart
4. **Teach the heart tissue to beat** with the rest of the heart

The 4 Tasks

1. **3D Print a structure** for heart tissue to grow in
2. **Grow heart tissue** inside the structure
3. **Make glue** to attach the tissue to the heart
Once our heart tissue is made, it must be safely joined to the heart.
4. **Teach the heart tissue to beat** with the rest of the heart

The 4 Tasks

1. **3D Print a structure** for heart tissue to grow in
2. **Grow heart tissue** inside the structure
3. **Make glue** to attach the tissue to the heart
4. **Teach the heart tissue to beat** with the rest of the heart

To be effective, the heart (and our tissue) must all contract at the same time.

Now, let's see how our tasks map onto coin flipping.



“Complete” the tasks by flipping coins

1. 3D Print a structure = Penny
2. Grow heart tissue = Nickel
3. Make glue = Dime
4. Teach the heart tissue to beat = Quarter

For the penny, nickel, and dime:

You must flip 5 heads

For the quarter:

You must flip 6 heads

You have just **1 minute** to do all of this.

There are 2 rounds to try to complete this task.

EEK! 

You have just **1 minute** to do all of this.

There are 2 rounds to try to complete this task.

Round 1: play by yourself

Round 2: play with a partner

EEK! 

Who can be your partner?

- A parent or guardian
- A sibling
- Someone that you are video chatting with

Can you think of anyone else?

EEK! 

Track your score

Use the sheet you made to keep count of your coin flips



\$0.01	\$0.05	\$0.10	\$0.25
 			



EEK! 

You are all set up.

Let's play!

EEK! 

ROUND 1:
PLAY ALONE

EEK! 

Round 1: Rules recap

- You are playing **alone**
- You have 60 seconds to flip:
 - 5 heads with your penny
 - 5 heads with your nickel
 - 5 heads with your dime
 - 6 heads with your quarter

Track your score here

\$0.01	\$0.05	\$0.10	\$0.25

Let's go!

When you flip to the next slide, a 1-minute timer will start.

If it does not work, you can use a phone or this link:

<https://vclock.com/set-timer-for-1-minute/>

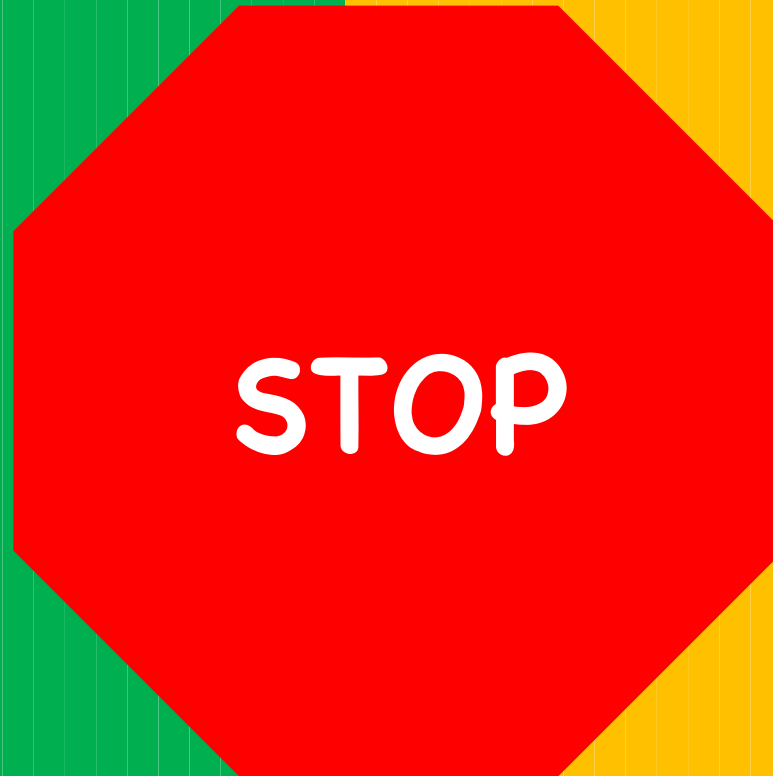


5 heads with your penny

5 heads with your nickel

5 heads with your dime

6 heads with your quarter

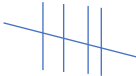





ROUND 2:
PLAY WITH A
PARTNER

Round 2: Rules recap

- You are playing **with a partner**
- You have 60 seconds to flip:
 - 5 heads with your penny
 - 5 heads with your nickel
 - 5 heads with your dime
 - 6 heads with your quarter



\$0.01	\$0.05	\$0.10	\$0.25
			

Round 2: Before you begin

- Take a minute to talk about how you will play
 - Do you need to teach your partner the rules?
 - How will you divide tasks?
 - How will you keep score?

Let's go!

When you flip to the next slide, a 1-minute timer will start.

If it does not work, you can use a phone or this link:

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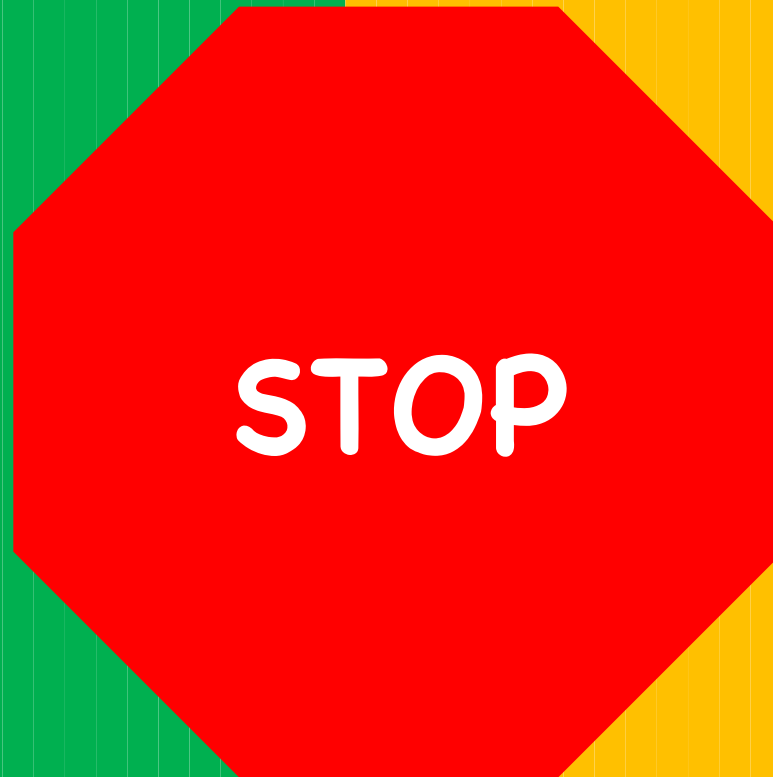
EEK! 

5 heads with your penny

5 heads with your nickel

5 heads with your dime

6 heads with your quarter



How did it go?

- Which round did you do better on?
- Which round was more fun?
- What was good about working with a partner?
- What was challenging about working with a partner?

Do you think you used any of the **3 skills that help engineers?**

Creativity

Teamwork

Hard work

You may have used...

- **Creativity** by figuring out your strategy for playing the game
- **Teamwork** by dividing up tasks with your partner
- **Hard work** by flipping coins quickly

Challenge Question:

**FLIPPING A COIN INVOLVES SOME
LUCK...**

**WHAT DO YOU THINK "LUCK" HAS TO DO
WITH MAKING HEART TISSUE?**

EEK! 

THANKS FOR
PLAYING!

EEK! 