WINTER GAMES

STEM

Curling

carly and Adam

Curling

NGSS Standards

Grades K-2

K-2-ETS1-2 Engineering Design

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

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-PS2-1 Motion and Stability: Forces and Interactions

Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

Grades 3-5

3-5-ETS1-2 Engineering Design

Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-PS2-2 Motion and Stability: Forces and Interactions

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

Curling

Teacher Instructions

Materials:

- 1 piece of aluminum foil (approximately 5 in. x 5 in.)
- washers, nuts, and/or pennies (approx. 4-8 per group)
- *Students should decide what they think will be the best weight for their curling rock.
- 1 pipe cleaner (Each group needs a different color.)

Instructions:

- Watch some of the included YouTube videos with your students to help develop background knowledge about curling.
- Students can also read the included article and complete the comprehension questions.
- After learning about curling students will construct a curling rock using only the materials listed above.
- Have students read the task instructions or read them aloud.
- Give students 10 minutes to plan individually and then 10 minutes to plan as a team. Use the included planning pages.
- Give students the materials listed above. Students will have 20 minutes to construct their curling rock.
- The washers, nuts, and/or pennines should be used as weights.
- The rock will also need a handle. This should be constructed using the pipe cleaner.
- At the end of the 20 minute time limit students will test their rocks by playing a modified game of curling.

Curling

Teacher Instructions (CONTINUED)

Curling Game Instructions:

- Print copies of the target so that there is one for every two groups.
- Tape the target on top of a table leaving approximately 12-20 inches of space from the front edge of the table to the target. (The larger the space from the front of the table to the target the more difficult it will be.)
- Place one strip of tape across the top and bottom of the target to keep it in place and allow for the rocks to easily slide from the table onto the paper.
- One person from each team will play rock paper scissors to see who throws first.
- The first player will stand behind the desk and throw their curling rock by holding onto the handle and sliding it on the table.
- Then a player from the other team will throw their rock.
- The team that throws the rock closest to the center of the target will be awarded a point for that end (round).
- If a player slides their rock off the table the point will go to the other team. If this happens to both teams replay the round.
- Just like in the real game of curling players may bump their opponent's rock and knock it farther away from the target.
- After each round alternate which team goes first.
- Play continues like this for 8-10 rounds.
- At the end add up all of the points. The team with the most points will be declared the winner.
- After playing students should reflect using the included reflection page. Students should reflect on how the weight of their rock contributed to the success of their curling match as well as how friction and forces impacted their results.

Curling

Teacher Instructions (CONTINUED)

Resources:

Two Minute Guide to the Sport of Curling (1:59 min)
https://www.youtube.com/watch?v=WXHh_wadqPw

Science Friction: All About the Physics of Curling (4:08 min)
https://www.youtube.com/watch?v=miB7HzUvmM0

Science of the Winter Olympics: Curling (4:59 min)
https://www.youtube.com/watch?v=GTVqtGTfIc8

Curling

Teacher Instructions

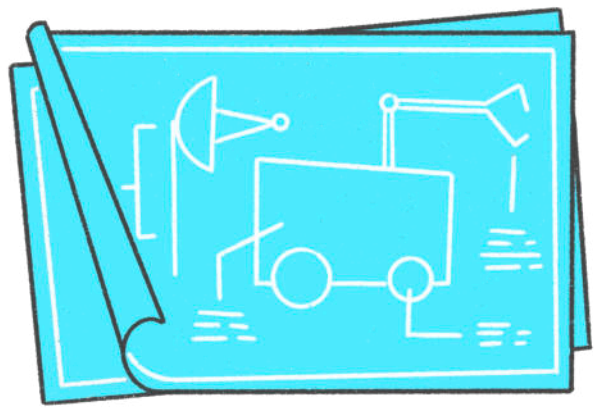
Example:

THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



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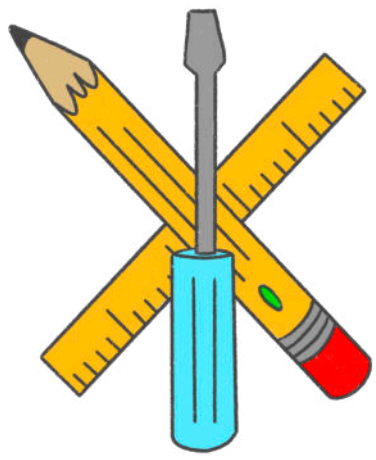
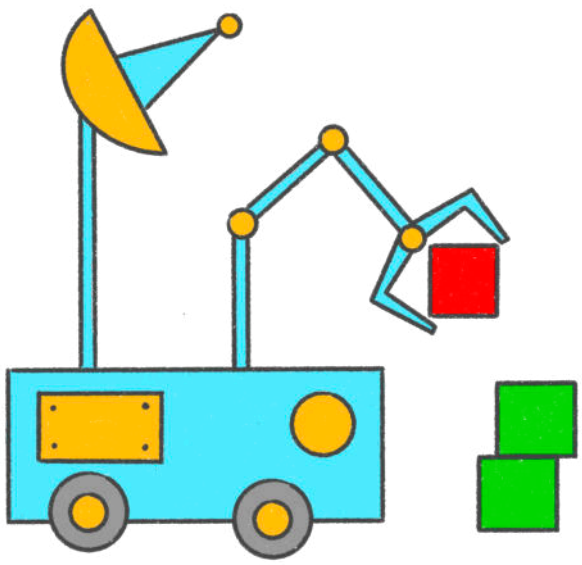


EXPERIMENT



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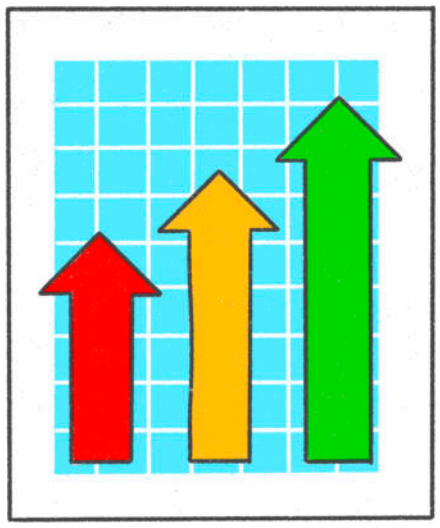
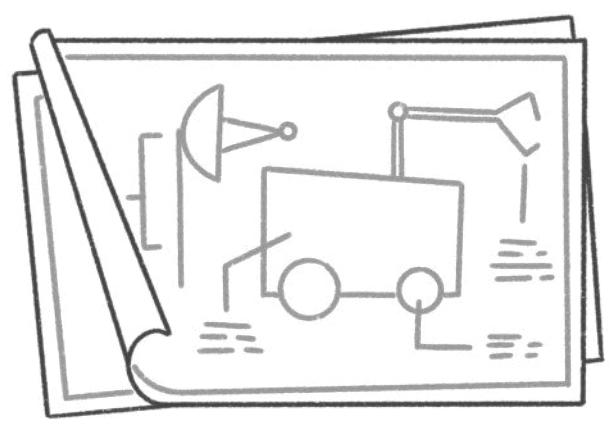


THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



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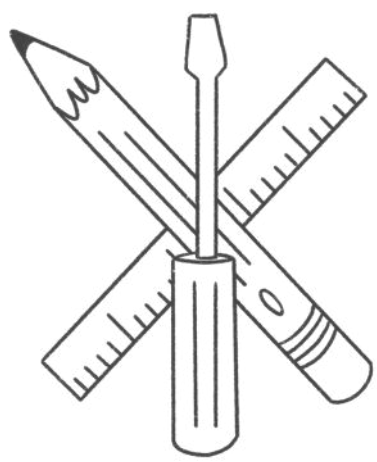

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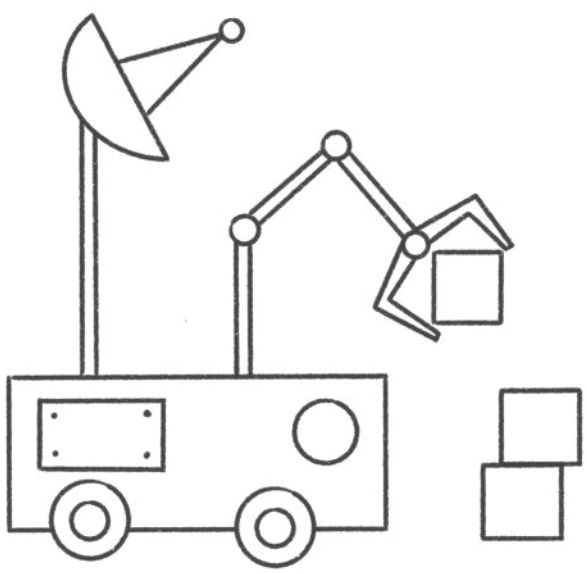

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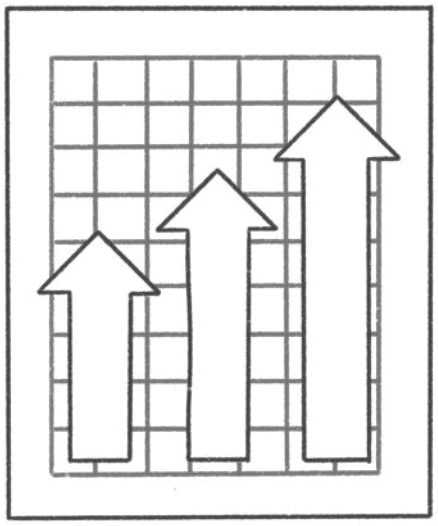


_____'S

CURLING STEM JOURNAL

Dear Students,

You are helping prepare for a winter sports competition. Part of your job involves making the rocks for the curling competition. In order to create your rock you may use any of the materials listed below.

Your rock must be a round ball with a handle. Use the pipe cleaner to create a handle and use the washers, nuts, and pennies as weights.

You will have 10 minutes to plan your design individually and 10 minutes to plan as a team. Your team will have 20 minutes to construct your rock. At the end of the time limit you will test your rock by playing a game of curling against another team. Good luck!

Materials:

1 piece of aluminum foil 1 pipe cleaner

washers, nuts, and pennies

Name:_____

ASK

What is the problem you are trying to solve?

_____

IMAGINE

Imagine the best way to solve the problem on your own.
Sketch out your design and brainstorm a list of ideas.

Ideas

_____

_____

_____

Sketch Space

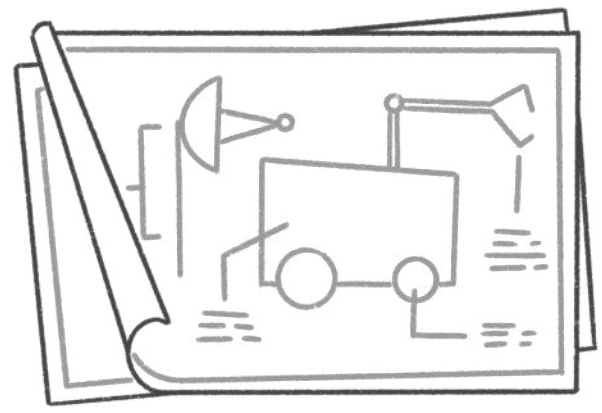
Name:_____

PLAN

With your group, sketch out your plan to solve the problem.

Ideas

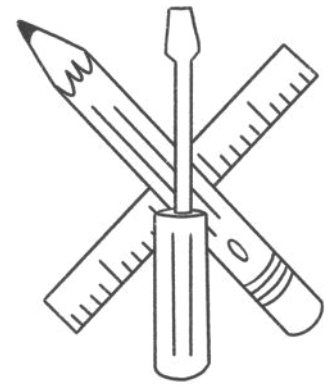
Sketch Space



Name:_____

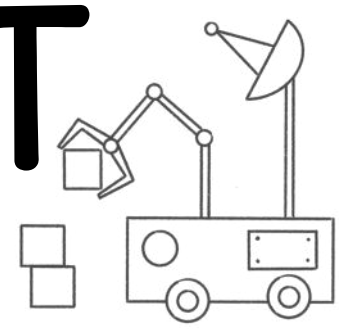
CREATE

Build your Prototype.



EXPERIMENT

Test your Design. Take Notes.



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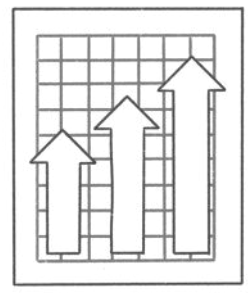
IMPROVE

What could you do to improve your design?



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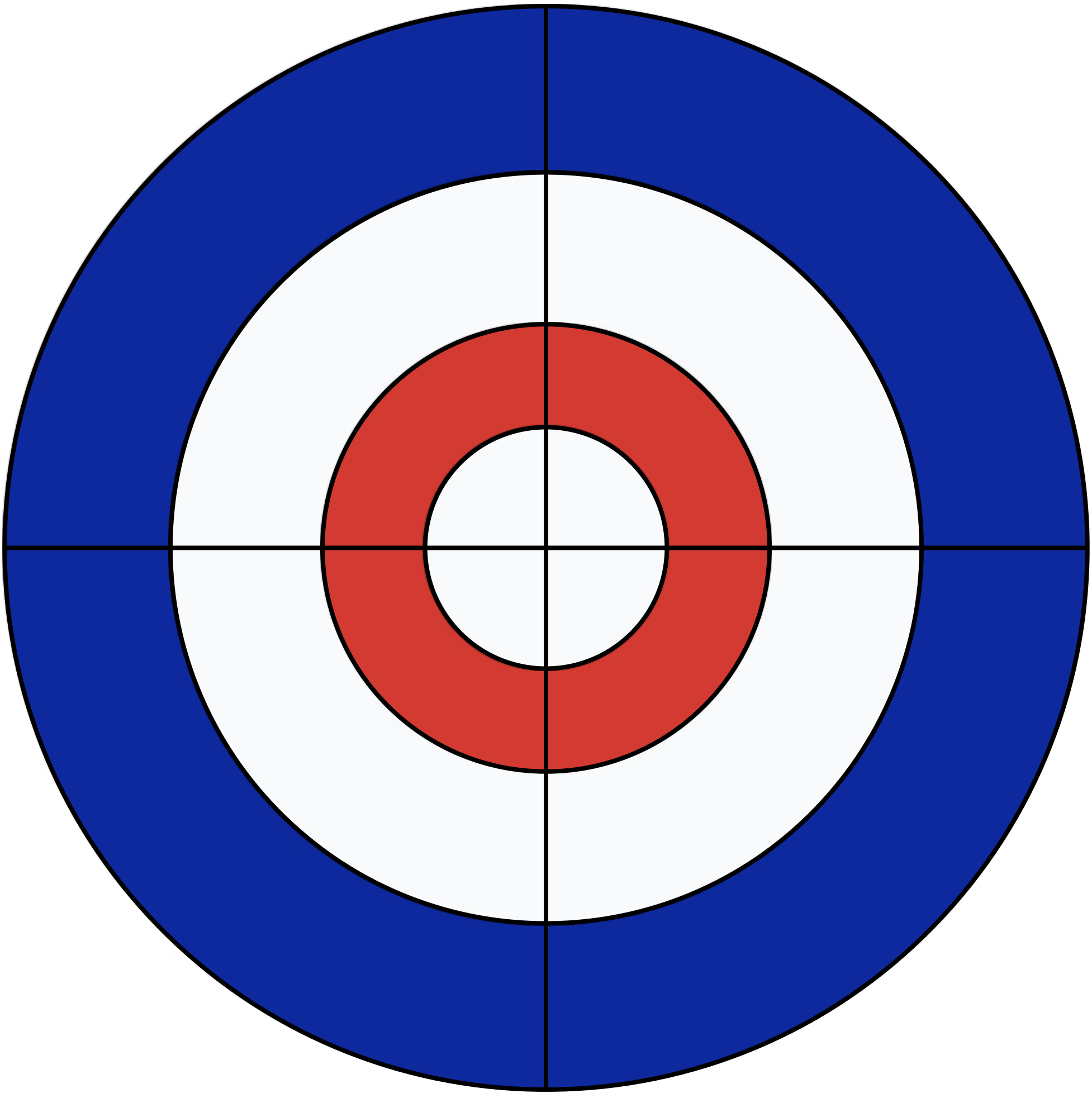
_____

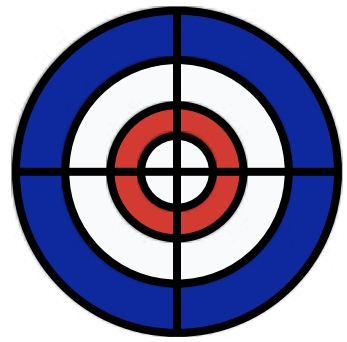
Sketch Space

CURLING TARGET



Name:_____

CURLING SCORE SHEET



TEAM:_____ TEAM:_____

Round	Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

Round	Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
TOTAL	

What is **Curling**?

The sport of curling is one of the oldest team sports. The game originated in Scotland in the 16th century. It was first included as a sport in the 1924 Olympics.

Curling is a game in which players slide 40-pound granite stones which are also called rocks on a sheet of ice towards a circular target called the house. In curling two teams of four compete against each other. Each team has eight stones. Teams take turns sliding their stones toward the target with the goal of getting as close to the center of the house as possible.

A game consists of eight or ten rounds which are called ends. An end is completed when both teams have thrown all of their stones. The winner of each end is the team that gets the closest to the center of the house.

During a curling match some players throw rocks while other players sweep. In one end each player throws two stones. When a rock is thrown it will curl or bend. This is partly due to how it is thrown as well as the conditions of the playing surface. Another important job in curling is sweeping. Sweepers make the rock go straighter and travel farther using a sweeping motion with their brooms on the ice directly in front of the rock.

A curling team is called a rink. Each of the four players on a team has a specific position. The curling positions are lead, second, third, and skip. The lead throws the first two rocks and sweeps the other six. The second sweeps the first two stones and the last four. The third throws the fifth and sixth rocks, and is also responsible for posting the score.The skip is the captain of the team and is therefore in charge of the team's strategy. The skip throws the last two rocks. It is also the job of the skip to advise the other players where to throw their shots and when to sweep.

Once all 16 rocks have been thrown the score for that end is counted. When the end is completed only the team that did the best in the round is awarded points. That team scores one point for every rock that is closer to the center of the house while the other team receives a score of zero.

Name:_____

What is curling?

What are the curling positions?

How many ends are in a curling match?

When did curling first make an appearance at the Olympics?

What I Know About

Curling

ABOUT US

Carly and Adam have been creating **STEM curriculum** for elementary students since 2015. In 2018, they created the **Elementary STEM Teachers Club Facebook Group** to bring like-minded educators together to collaborate around STEM topics.

As a result of the collaboration in the STEM Facebook group, they launched the **STEM Teacher Summit online conference** in June of 2020. Carly and Adam believe in the power of teacher collaboration. We Teach STEM Better Together! You can connect with Carly and Adam at **www.carlyandadam.com** as well as on **Facebook**, **Instagram**, and **Twitter**.

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