WINTER GAMES

STEM

Biathlon

carly and Adam

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STEM Teachers Club

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Biathlon

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.

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.

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Biathlon

Teacher Instructions

Materials:

- Materials for each group of 2-3 students:
- 1 large plastic cup
- 1 small plastic cup (Dixie cup)
- 4 medium size rubber bands
- 1 ping pong ball
- scissors
- hole punch
- Additional Materials:
- 3 medium size binder clips
- tape

Instructions:

- Watch some of the included YouTube videos with your students to help build background knowledge about the biathlon.
    - The Evolution of Biathlon Equipment (4:04 min)
        - https://www.youtube.com/watch?v=VC4WRypi01o
    - The Technology of the Biathlon Rifle (3:24 min)
        - https://www.youtube.com/watch?v=j9hkBwd6ozg
- Students can also read the included article and complete the comprehension questions.
- After learning about the biathlon students will construct a shooter to launch a ping pong ball at a target.
- 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 30 minutes to construct their shooter.
- While constructing students should think about where the ball will rest before it is launched as well as how to create a shooter that will accurately launch the ping pong ball at the target
- The ping pong ball must be launched out of the shooter and cannot be thrown.
- At the end of the 30 minute time limit students will test their shooters.

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Biathlon

Teacher Instructions (CONTINUED)

- Print and laminate 3-5 targets and stand them up using the binder clips. Create a starting line with tape approximately 5-10 feet in front of the targets. The farther back the line is the more difficult it will be.
- The winner is the team that knocks down the most targets. If there is a tie have winning teams continue to face off until a final winner is declared
- For even more fun have students participate in a biathlon simulation.
- In addition to setting up the targets create a course in your classroom. This can be as simple as circling around the edges of the classroom. The targets should be placed at the end of the course.
- Print two skis and laminate them. One student at a time will ski around the course by standing on top of the skis and sliding around the room. Time students from the beginning of the course to when they reach the targets.
- Students will shoot one time per target. If a target is missed add 1 second onto the time per target missed.
- The team with the fastest time will be declared the winner.

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Biathlon

Teacher Instructions

Example:

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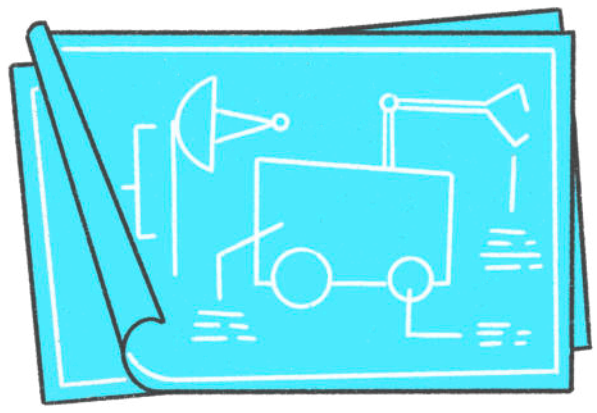
THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



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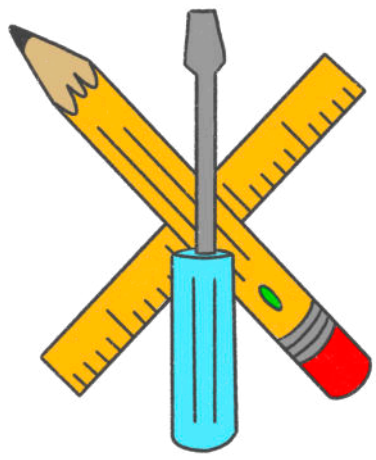
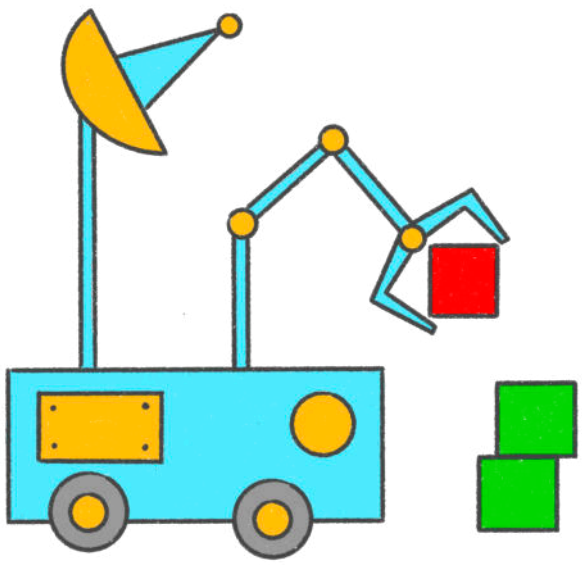


EXPERIMENT



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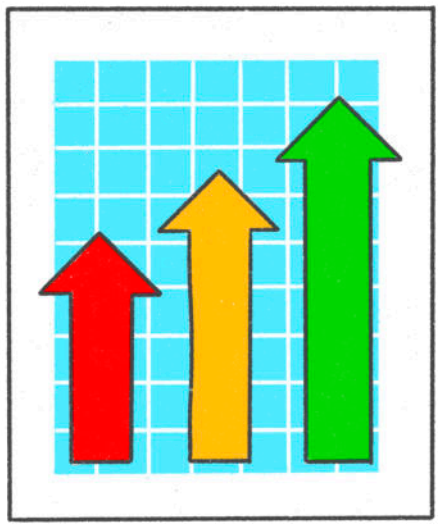

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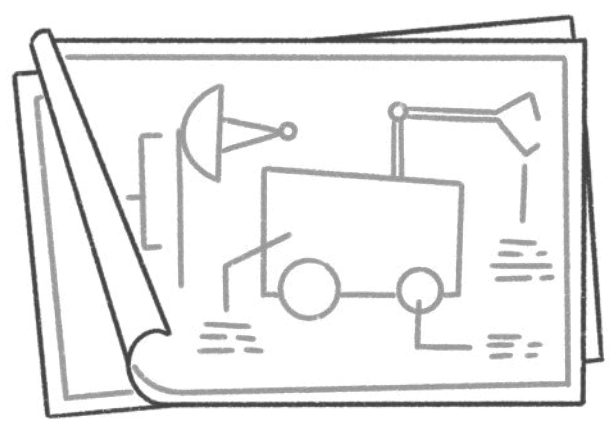
THE ENGINEERING DESIGN PROCESS

ASK

IMAGINE

PLAN



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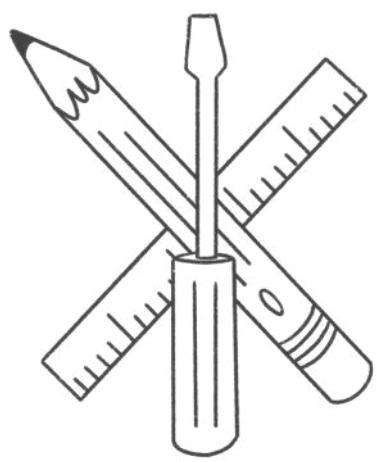

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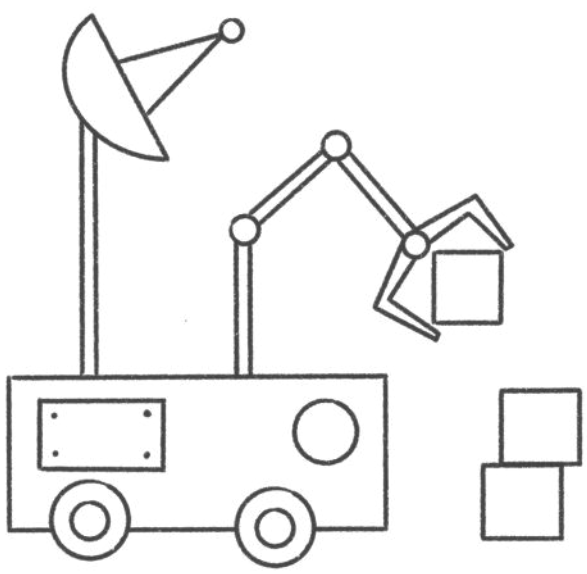

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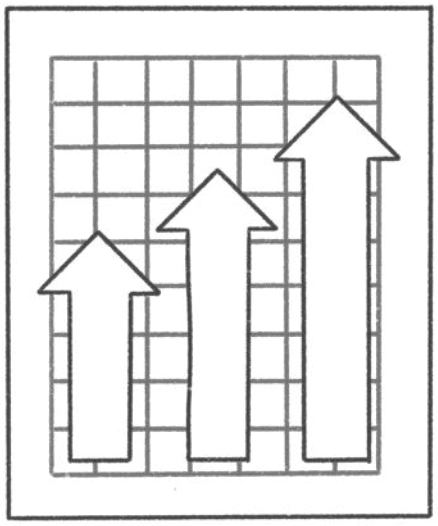

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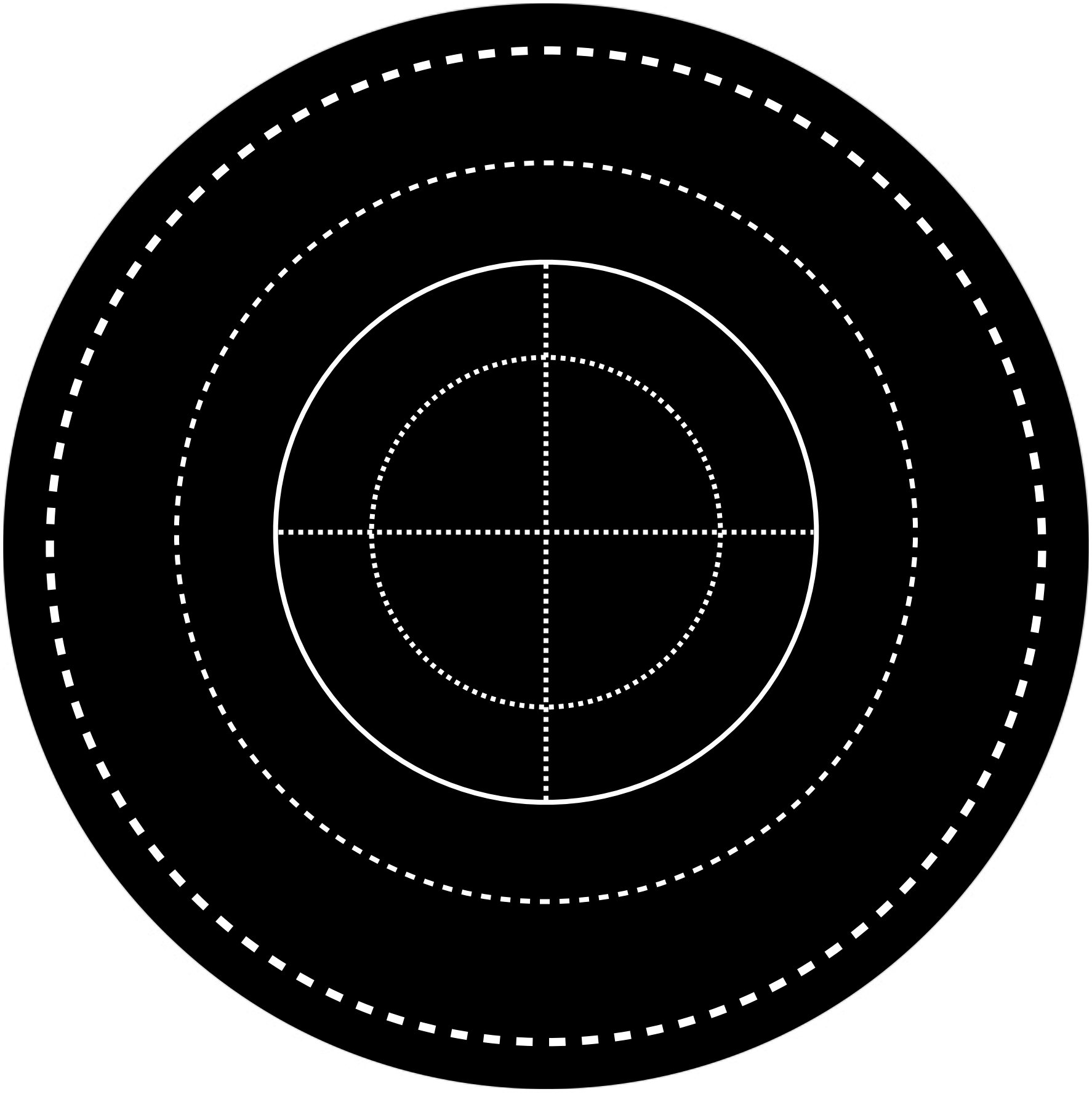
BIATHLON TARGET

Directions: Print three targets and laminate.



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BIATHLON SKI

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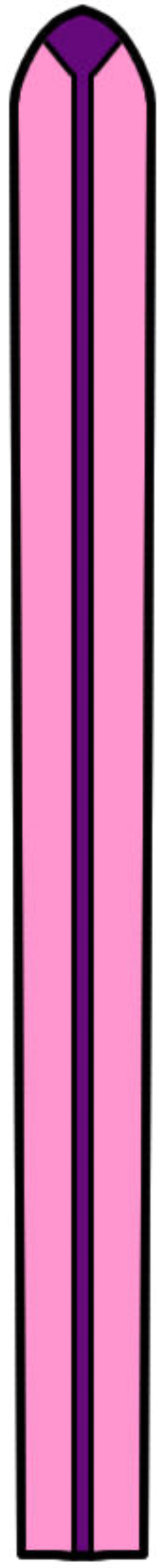
BIATHLON SKI



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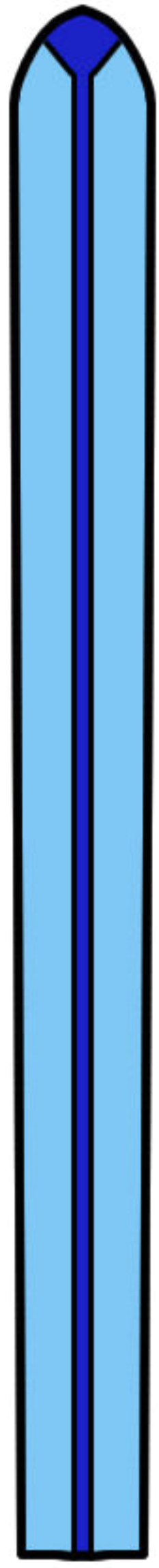
BIATHLON SKI



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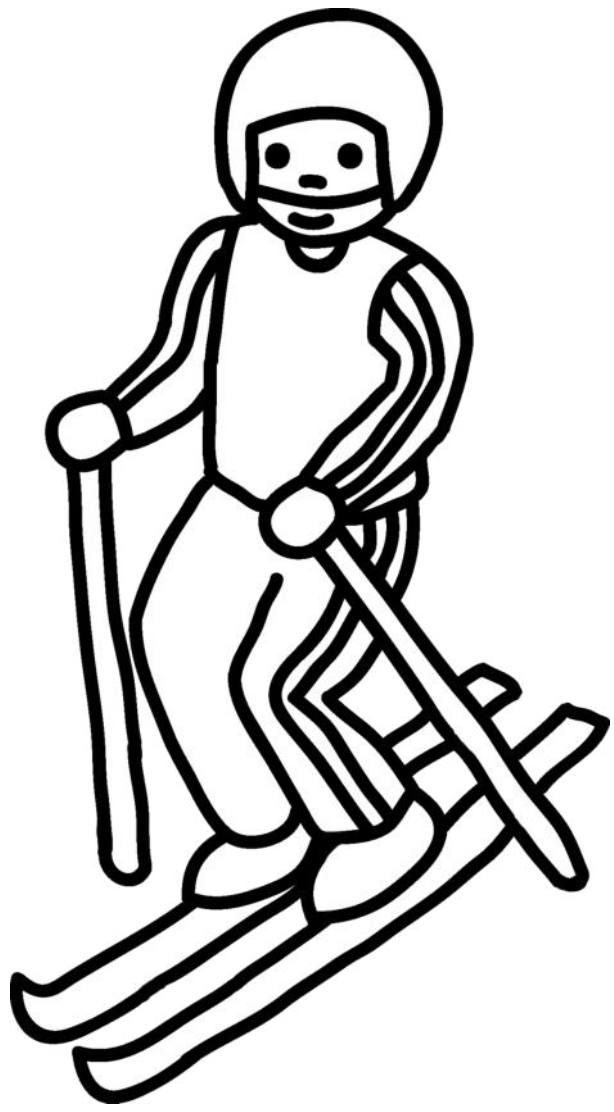

_____'S

BIATHLON

STEM

JOURNAL

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Dear Students,

You are helping prepare for a winter competition. Part of your job involves designing a shooter for the biathlon. In order to create your shooter you may use any of the supplies listed below. In your design think about where the ball will rest before it is launched as well as how to create a shooter that will accurately launch the ping pong ball at the target.

You will have 10 minutes to plan your design individually and 10 minutes to plan as a team. Your team will have 30 minutes to construct your shooter. At the end of the time limit you will test your design by shooting a ping pong ball at targets. Good luck!

Materials:

1 large plastic cup	scissors
1 small plastic cup	4 rubber bands
1 ping pong ball	1 hole punch

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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

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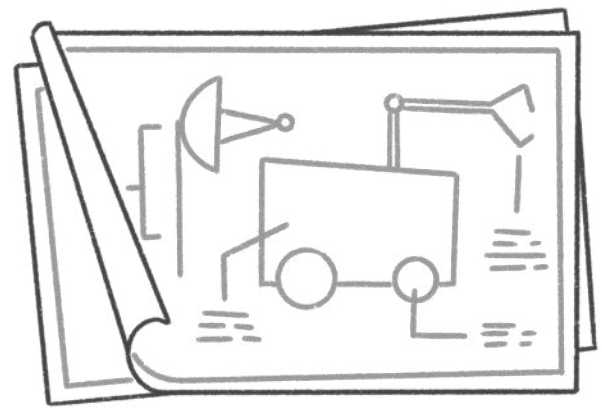
Name:_____

PLAN

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

Ideas

Sketch Space



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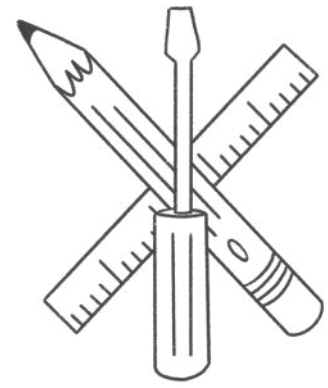
Name:_____

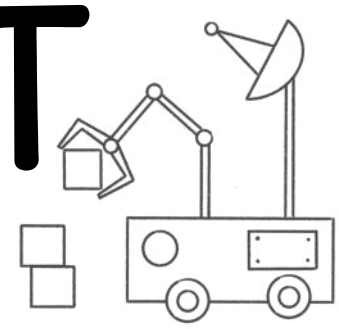
CREATE

Build your Prototype.



EXPERIMENT

Test your Design. Take Notes.



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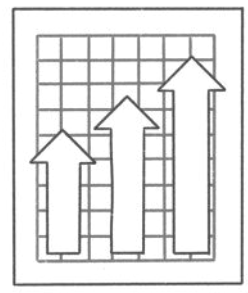
IMPROVE

What could you do to improve your design?



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Sketch Space

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What is the **Biathlon**?

The biathlon winter sport is a combination of cross-country skiing and rifle shooting. The sport originated in Norway around the 18th century. The sport became part of the Olympic Games in 1960, and women were included in the sport in 1992.

A biathlon competition involves two parts which are skiing and shooting. Competitors ski through a cross-country trail which is divided into two or four shooting rounds. For half of the shooting rounds the competitor shoots standing up while the other half is completed lying down.

During each shooting round, the biathletes must hit five targets. Biathletes who do not perform well during the shooting portion of the event are penalized by having extra time or distance added on. The penalties may include skiing around a 150 meter penalty loop or one minute may be added to the competitors total time. The winner of the biathlon is the person with the shortest total time.

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Name:_____

What I Know About the Biathlon

Where did the biathlon originate?

When did the biathlon become an Olympic sport?

What are the two parts of the biathlon competition?

What happens to a competitor who does not perform well in the shooting portion of the biathlon?

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Name:_____

What I Know About the **Biathlon**

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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**.

FOLLOW US ON SOCIAL MEDIA

INFO@CARLYANDADAMBLOG.COM

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TEACHING HAPPY HEARTS

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