
WINTER
GAMES
STEM
Ski Jumping
carly and Adam

A FREE supportive Facebook community for STEM teachers!

STEM Teachers Club

Click this Image To Join Today!

Ski Jumping

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.

3-PS2-1 Motion and Stability: Forces and Interactions

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

Ski Jumping

Teacher Instructions

Materials:

- washers, nuts, and/or pennies (approximately 4-6)
  *Students should decide the best weight for their skis.
- 4 straws
- 2 feet of tape
- 2 pipe cleaners
- 1 sheet of construction paper
- scissors
- rulers

Instructions:

- Watch some of the included YouTube videos with your students to help build background knowledge about ski jumping.
- Students can also read the included article and complete the comprehension questions.
- After learning about ski jumping students will construct skis and a ski jumper 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 30 minutes to construct their skis and ski jumper.
- While constructing students should think about the weight of the skis and ski jumper and how it will impact the distance of the jump. Students should also consider how they will balance the ski jumper so that he lands upright after jumping.
- The skier must be attached to the skis and be standing on top of them.
- At the end of the 30 minute time limit students will test their ski jumpers.
- Use a table to test the ski jumpers. Mark a line with tape approximately 1 foot before the edge of the table. The ski jumpers will start at the tape line and students will slide/push them off of the edge of the table.
- Have students measure the distance of their jump. Ski jumpers must land upright in order for the jump to count.
- The ski jumper with the farthest jumping distance will be declared the winner.

Ski Jumping

Teacher Instructions (CONTINUED)

Resources:

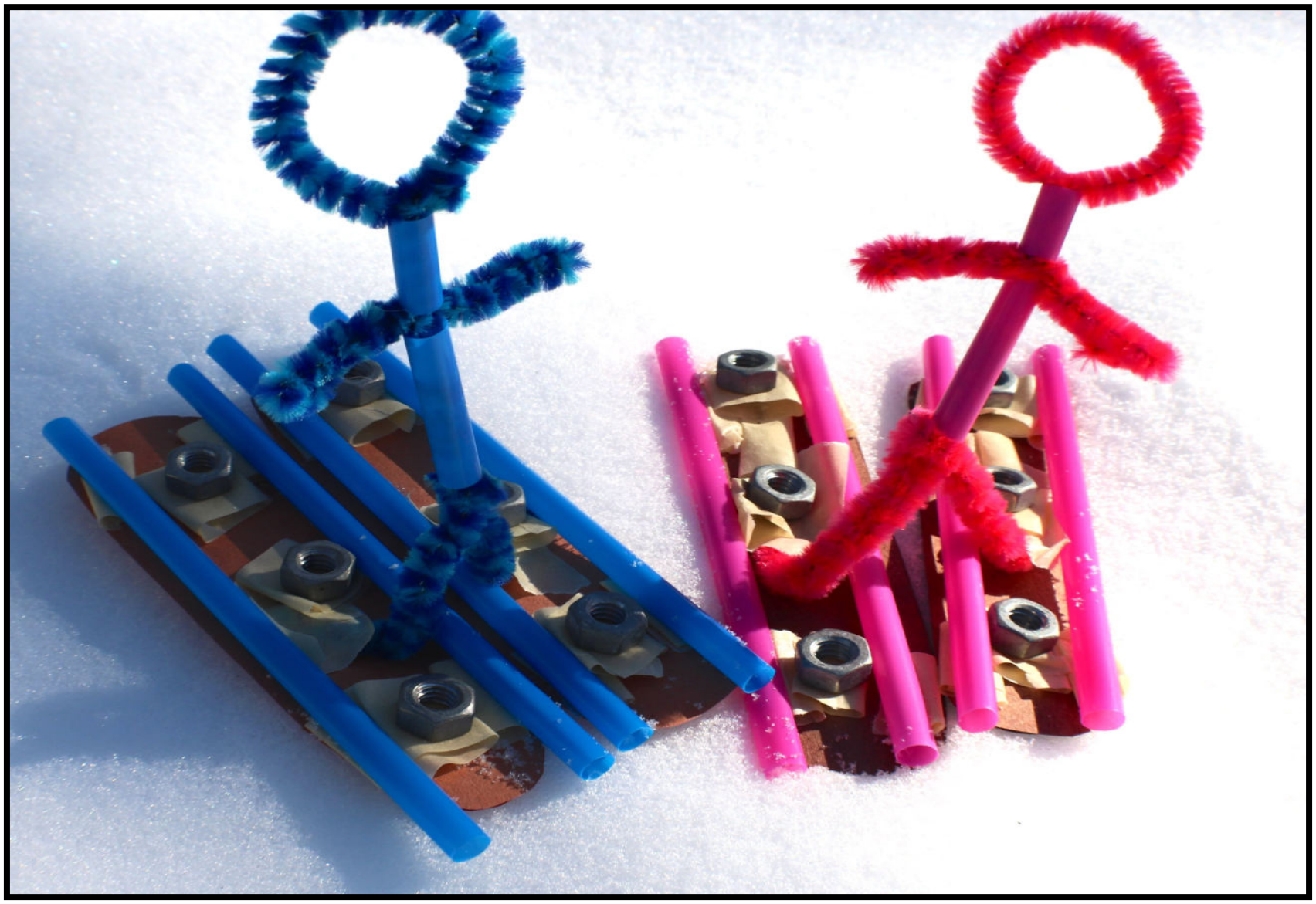
Science of the Winter Olympics: Ski Jumping (4:19 min)
https://www.youtube.com/watch?v=BDpxSLv89Y8

The History of Ski Jumping (5:51 min)
https://www.youtube.com/watch?v=RG23HWsffK4

Ski Jumping

Teacher Instructions

Example:

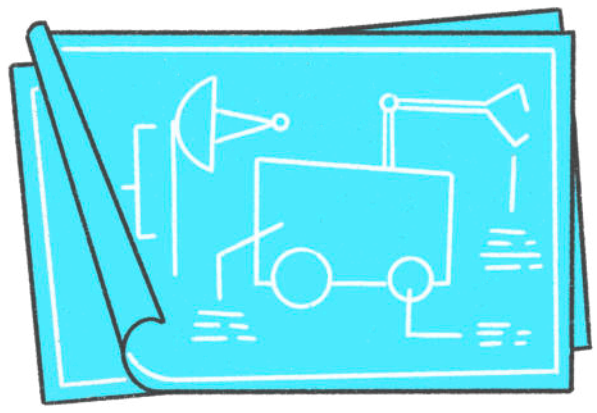


THE ENGINEERING DESIGN PROCESS

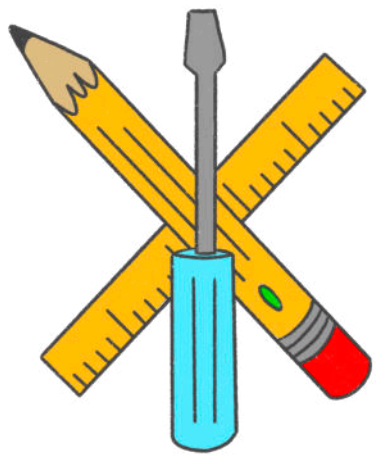
ASK

IMAGINE

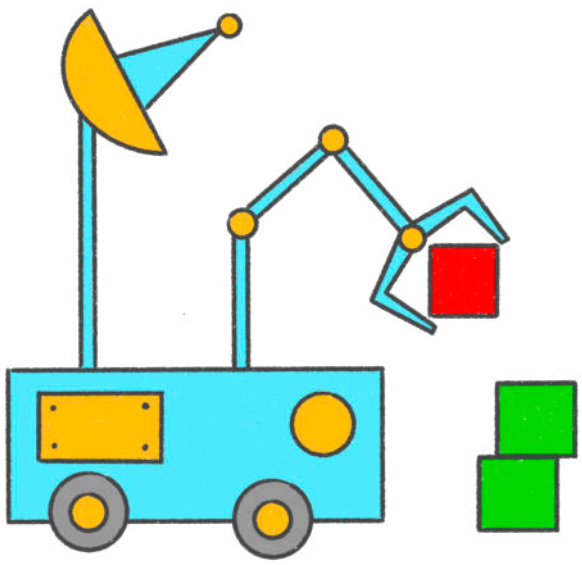
PLAN



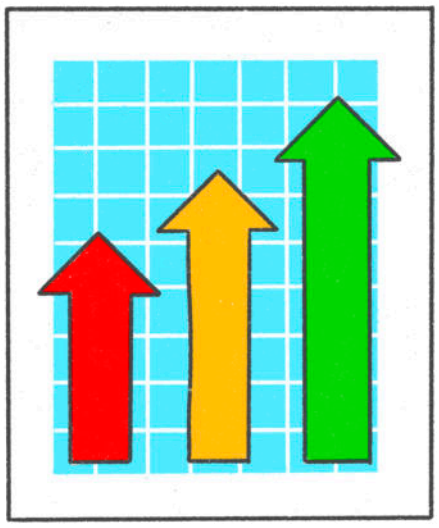
CREATE



EXPERIMENT



IMPROVE

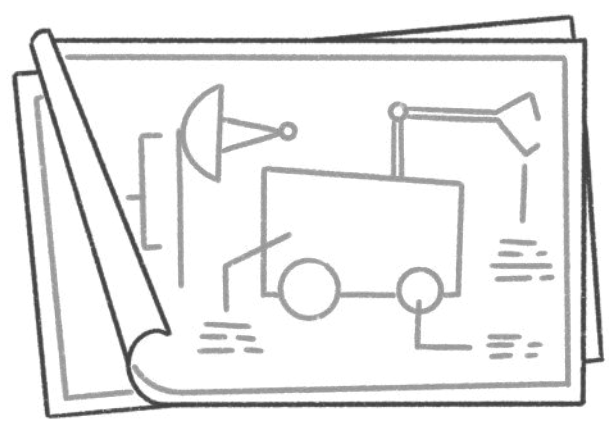


THE ENGINEERING DESIGN PROCESS

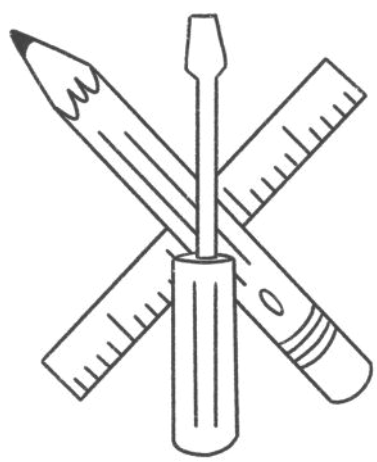
ASK

IMAGINE

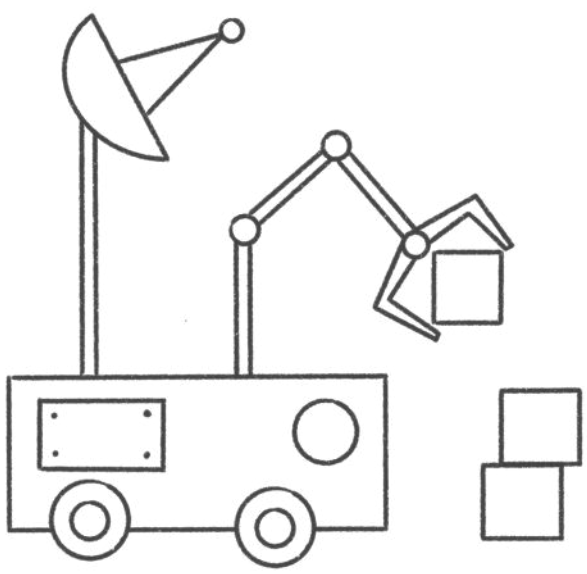
PLAN



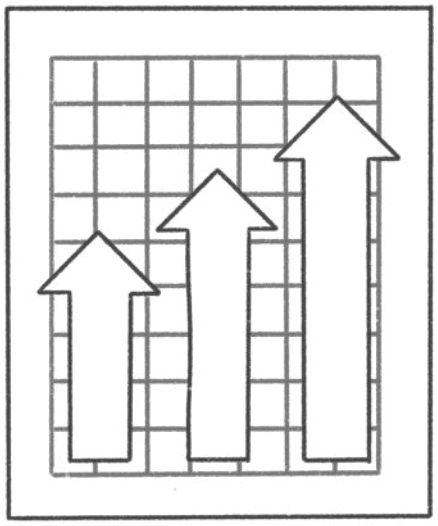
CREATE

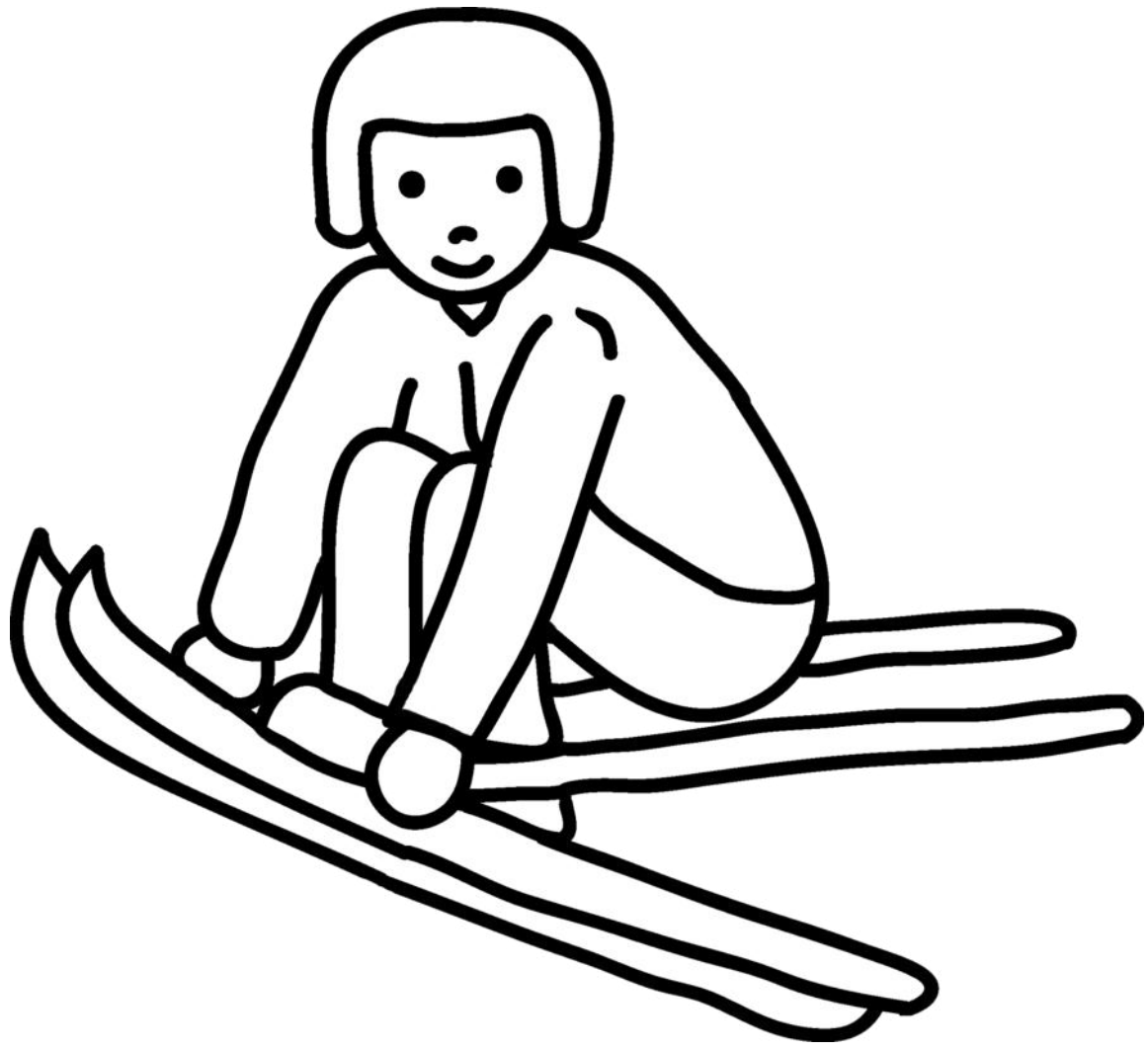


EXPERIMENT



IMPROVE





_____'S

Ski Jumping

STEM

JOURNAL

Dear Students,

You are helping prepare for a winter competition. Part of your job involves designing skis for the ski jump. In order to create your skis you may use any of the materials listed below. You will also need to create a ski jumper to use your skis. The skier must stand on top and be attached to the skis. The washers, nuts, and pennies can be used as weights. Do you think your skier will go farther if it weighs more or less? You should also think about how to balance your skier so that he lands on his feet.

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 skis and ski jumper. At the end of the time limit you will test your design by having your skier jump off of a table. The skier that jumps the farthest distance will be declared the winner. Good luck!

Materials:

2 pipe cleaners — scissors

1 sheet of construction paper — 2 feet of tape

4 straws — washers, nuts, and/or 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

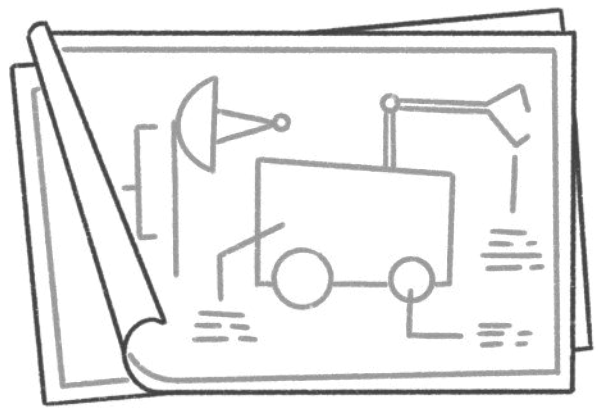
Name:_____

PLAN

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

Ideas

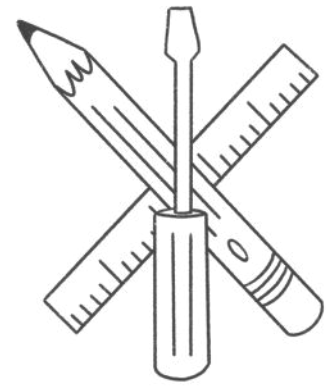
Sketch Space



Name:_____

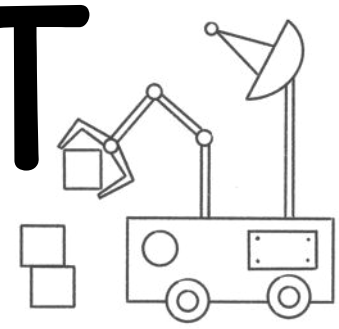
CREATE

Build your Prototype.



EXPERIMENT

Test your Design. Take Notes.

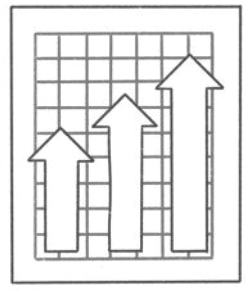


_____

_____

IMPROVE

What could you do to improve your design?

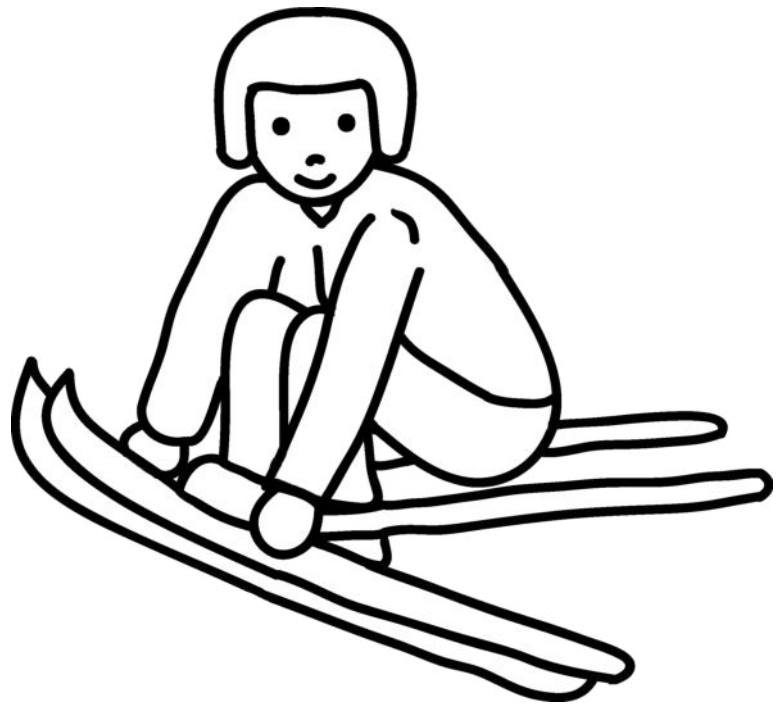


_____

_____

Sketch Space

What is **Ski Jumping**?



Ski jumping is a winter sport that originated in Norway towards the end of the 19th century. The popularity of the sport spread at the beginning of the 20th century to Europe as well as North America.

A ski jumping arena includes a jumping ramp, take-off table, and a landing hill. Each jump is judged based on distance and style. The most style points a ski jumper can be awarded is 20. During a ski jumping competition five judges award scores for style. The highest and lowest scores are not counted, but the three remaining style scores are added to the distance score. Each jumper gets a practice jump and two scored jumps. The winner of the event is the one with the highest score.

Ski jumping has been a sport in the Winter Olympics since 1924. Women began participating in the sport in the 1990s, and an Olympic event for women was first held in 2014.

The ski jumping technique has dramatically changed over the years from skiers jumping with skis parallel to the V-style. The V-style was created by Swedish ski jumper Jan Boklöv in the 1980s. Using this new style skiers are able to jump approximately 10 percent farther than with the parallel ski technique.

Name:_____

What country did ski jumping originate in?

How are ski jumpers scored?

When did women begin participating in ski jumping?

What is considered the best ski jumping technique?

What I Know About

Ski Jumping

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

Get access to our FREE STEM Resource Library.

TERMS OF USE

CREDITS