



SASKATCHEWAN
SPORTS
HALL OF FAME

STEM in sports

Engineering

Have you ever wondered how Science, Technology, Engineering and Math connect to sport? They are, in fact, a very large part of sport. In this lesson we will focus on one part of **Engineering in sport**.

Teachers: Please use this as a starting point. Modify and add in any way that best suits your classroom.

Grade focus:

all grade levels

Objective:

To get students thinking about how engineering and sport work together. In this lesson we will focus on the changes in sport equipment. This can be done as a whole class together – focusing on one item such as helmets – or can be done individually or in groups.

Educational Outcomes:

CRK.3	CC1.3	CR2.2	CC3.3	CR4.3	CC5.2	CR6.2	CR7.5
CCK.3	CR1.2	CR2.3	CR3.3	CC4.2	CC5.3	CR6.5	CR7.7
SSK.1	OM1.2	DR2.1		CC4.3		CR6.7	CR7.5
						CC6.4	CR7.6
CR8.4	CR9.3					CC6.5	
CR8.7	CR9.4					CC6.6	
CR8.5	CC9.5					FL6.2	
CR8.6	CC9.6						

Lesson:

- Whether this is done in one large group, small groups or individually, pick your favourite sport. If you don't have one, pick one you would like to learn more about or that you are familiar with.
- Make a list of all the equipment needed to play the game. (chart provided) Make sure you include what is worn, what is needed to keep you safe and all equipment.
- What is used to help keep them safe? (ex. Helmet)
- What is used to help athletes perform their best? (ex. Shoes) Do the uniforms they wear have anything to do with performance?
- Engineers design with the goal of creating lighter, faster and stronger equipment.

<u>Sport</u>	<u>Everything needed to play the game</u>	<u>What is used to keep athletes safe</u>	<u>What is used to help athletes perform their best</u>

Grades K-3

- Once your list has been made with teacher help, younger grades can do the matching sheet highlighting some of the changes made in the equipment. (sheet attached)
- Conversation led by teacher will follow about the differences they notice and why this may have changed. All changes would have been made to make the athletes safer or perform better.

Grades 4-8

- Middle grades can then start a timeline of the progression of one piece of equipment. (Sample sheet attached) Helmets, shoes, or anything handheld like bats, racquets etc. are great examples to use.
- How have the pieces of equipment changed over the years?
- Depending on how long this takes, students could choose to do another piece.
- Timelines should include illustrations of the progression.
- Don't forget to ask some questions like:
 - Why does a golf ball have so many dimples?
 - Why do professional baseball players only use wooden bats?
 - How much air does a football have in it?
 - Why have football helmets changed so much over the years?

Grades 9-12

- High School grades could also do a timeline to show progression of change but focus on the materials used in the equipment. Why are the materials so important?
- What makes them lighter?
- What scientific data has been collected to collaborate this?
- Students could create this using power point to enforce their findings and illustrate the changes.
- Don't forget to ask some questions like:
 - Why does a golf ball have so many dimples?
 - Why do professional baseball players only use wooden bats?
 - How much air does a football have in it?
 - Why have football helmets changed so much over the years?

Experiment: Students in Grades 4-12 could do the Egg Drop Challenge. (see attached)

- Using found materials or materials only around the classroom, students must design protection around an egg that when dropped from a predetermined height will keep the egg from breaking.
- Using the sheet attached, students will illustrate what they built and why they think it will work.
- This experiment shows in simplified terms how design or engineering is important in protection.

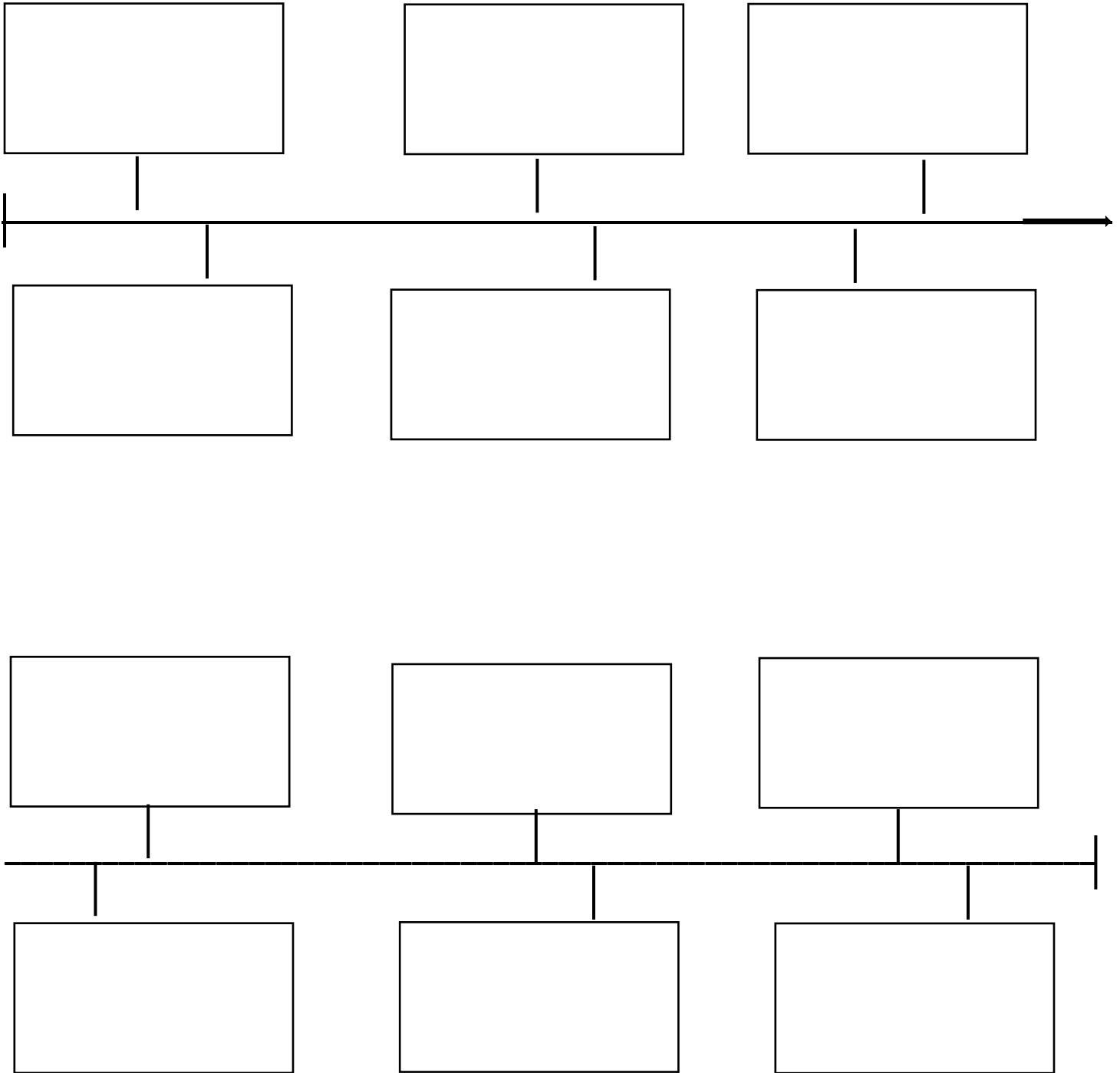
Sport Equipment Matching

Match the older sport equipment with its matching newer model. Draw a line to connect them. What are they? What sport do they represent? Discuss what differences you see.



Timeline for sport equipment

(students can modify to suit)



Egg Drop Challenge

Objective: Design a system to protect an egg from cracking or breaking from a high fall.

Materials: Use anything you'd like! Some ideas include: paper towels, straws, tape, cardboard tubes, paper, popsicle sticks, bags or old boxes.

Illustrate or insert a photo of your design.



Explain why you think your design will protect an egg from breaking from a fall:

Did your design work? Why or why not? What could have been improved upon?
