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Virtual CLASSROOM

Lesson Guide | Description

Instructor: Tina Valentine
Grade Level: 3 - 8
Subject: Science and Math

Students will use skills in measurement to accurately measure length, volume, time, and mass in Olympic events.

Wonder How:

Have you ever wondered why we need accurate measurements? Have you ever wondered why accurate measurements are important in Olympic events?

Goal:

Students will create their own Olympic event, collect data, and determine medal winners for the event. The overall winner will be selected based on calculations of point values.

Lesson Guide Agenda:

- ❖ Vocabulary
- ❖ Fun Facts
- ❖ Materials List
- ❖ Activity Instructions
- ❖ Event #1: Javelin – Straw Throw
- ❖ Event #2: Discus – Paper Plate Toss
- ❖ Event #3: Shot Put – Cotton Ball
- ❖ Event #4: Sphere Grabs with the Right Hand
- ❖ Event #5: Sponge Squeeze
- ❖ Event #6: Water Bottle Flip
- ❖ Event #7: Clean Sweep
- ❖ Scoring and Awards
- ❖ Challenge!
- ❖ Additional Resources
- ❖ Oklahoma Academic Standards

U.S. Standard Measurement – Units of measurement commonly used in the USA, including:
- Liquids: Fluid ounces
- Mass: Ounces
- Length: Inches and Feet
- Time: Seconds

Metric Measurement – The metric system is a universal system of measuring used worldwide.
- (m) is the meter for length
- (g) is the gram for mass
- (L) is the liter for volume of a liquid

Inch – A unit of length equal to 1/12 foot.

Centimeter – A unit of length. It is about the width of a fingernail. There are 100 centimeters in a meter. The abbreviation is (cm).

Millimeters – A unit of length equal to 1/1000 meter. The abbreviation is (mm).

Lesson Guide | Vocabulary

Mass – Mass is a measurement of how much matter is in an object. Mass is usually measured in grams, which is abbreviated as (g).

Volume – Volume is the quantity of three-dimensional space occupied by a liquid, solid, or gas. Common units used to express volume include liters, cubic meters, ounces, and cubic feet.

Time – A measured or measurable period and is also the subject of mathematical and scientific investigation. It will be calculated to the hundredth of a second.

Fun Facts!

- The Summer Olympics may be postponed for the year of 2020, but the games have been going on every four years since 776 BC!

- All Olympic games rely on a measurement system.

- Many Olympic events have been won by the smallest of measurements. Take Olympic Gold metalist Michael Phelps (USA) in the Beijing 2008 Summer Olympics winning his 7th gold medal and setting an Olympic record in the Men's 100m Butterfly, with a time of 50:58, only a hundredth of a second ahead of Milorad Cavic of Serbia. Phelps won by 4.7 mm!

Fun Facts!

- The women's 100-meter final in the 1992 Barcelona Games was one of the closest track races in Olympic history. Five runners, including Team USA's Gail Devers, ran across the finish line at almost the exact same time. This caused intense confusion and deliberation among officials. After carefully reviewing slow-motion footage, Devers was awarded 1st place, and the runner crossing 5th finished less that 1/10 of a second later!

- The Olympic timers consist of a team of 450 technicians who use more than 400 tons of equipment to ensure accurate timing.

Measuring Olympics

Materials Needed:

Measuring Tape
Stopwatch or timer
Measuring cups or graduated cylinder
Scale
Straws
Paper plates
Cotton balls
Spherical shaped items (marbles and pennies work)
Two bowls/cups
Sponges
Water bottles partly filled with water
Broom
Golf balls
Calculator
Masking tape

Note: The data sheet, score card, podium sheet, and winner sheet are provided on HomeRoom.

Watch the "Measurement Olympics" video before continuing to the challenge!

Be sure to print your data tables found on HomeRoom to record your measurements for each event!

If you have any questions throughout this lesson, please email teachers@oerb.com.
We would love to hear from you!

Instructions:

1. Choose events using measurement.
   - Javelin– Straw throw
   - Discus – Paper Plate Toss
   - Shot Put – Cotton Ball
   - Sphere Grabs with the Right Hand
   - Sponge Squeeze
   - Water bottle flip
   - Clean Sweep

2. Collect materials and set up events.

Instructions:

3. Create data tables to collect data or use the data tables that have been included on HomeRoom:
    - <u>Data Sheet</u> – for individual data collection
    - <u>Score Card</u> – for athletes mean or average measures in events
    - <u>Step Up to the Podium</u> – for gold, silver, and bronze participants for each event.
    - <u>Overall Winner</u> – Overall winner of the 2020 Measurement Olympics.

4. Make medals/awards – gold, silver, bronze for winners.

5. Plan an opening and closing ceremony. To make it fun and official, dress up, play music, and decorate!
    - Olympic music can be found here.

Let the Games Begin!

Event #1: Javelin – Straw Throw

Materials Needed:

Straws to throw
Two measuring tapes
Masking tape

Event #1: Javelin – Straw Throw

Instructions:

1. Tape down the measurement tapes end to end to make sure you have at least 10 feet of length. These should be laid out on the ground with a clearly marked start line at zero.

    > *Note: You may use this measuring tape and start line for other events.*

2. Hold the straw by your ear with your elbow bent. Use the bent elbow as a hinge and throw/release the straw.

3. Measure the distance of the throw in centimeters (cm) or inches (in). Be sure to add both tape measures together if it lands past the first one.

4. Record the results on the Data Sheet for 3 trials of this event.

5. Add the 3 trials together and divide by 3 to find the mean, or average.

Event #2: Discus – Paper Plate Toss

Materials Needed:

Paper plates

Use the same length of measurement tape to find the distance of your throw.

Event #2: Discus – Paper Plate Toss

Instructions:

1. Stand behind the starting line and throw the paper plate like a frisbee.

2. Measure the distance of the throw in centimeters (cm) or inches (in).

3. Record results on Data Sheet for 3 trials of this event.

4. Add the 3 trials together and divide by 3 to find the mean or average.

Event #3: Shot Put – Cotton Ball

Materials Needed:

Cotton balls

Use the same length of measurement tape to find the distance of your throw.

Event #3: Shot Put – Cotton Ball

Instructions:

1. Place the back of your hand on your shoulder. Using your elbow as the hinge, push you hand up and out to launch your cotton ball.

2. Measure the distance of the throw in centimeters (cm) or inches (in).

3. Record results on Data Sheet for 3 trials of this event.

4. Add the 3 trials together and divide by 3 to find the mean or average.

Event #4: Sphere Grabs with the Right Hand

Materials Needed:

Spheres (marbles or pennies work)
Bowl
Scale – Measure in grams or ounces

Event #4: Sphere Grabs with the Right Hand

Instructions:

1. Use your right hand to grab as many spheres or pennies as you can from a bowl. Transport them to an empty bowl on scale. Weigh or mass the spheres or pennies in grams or ounces.

    Note: If you do not have access to a scale, you can calculate the mass by multiplying the number of pennies by 2.5 grams. U.S. pennies since 1982 weigh 2.5g/0.088oz. (Union shield pennies weigh 3.11g/0.109oz.)

2. Place the spheres or pennies back in the bowl.

3. Record results on the Data Sheet for 3 trials of this event.

4. Add the 3 trials together and divide by 3 to find the mean or average.

Event #5: Sponge Squeeze

Materials Needed:

Sponge
Two bowls
Water
Measuring cup/graduated cylinder – measure in mL or oz.

Event #5: Sponge Squeeze

Instructions:

1. Submerge a sponge in a cup/bowl filled with water.

2. Use your left hand to grab a sponge.

3. Hold the sponge over an empty cup/bowl and squeeze as much water from the sponge as possible.

4. Measure the amount of water squeezed out of the sponge.

5. Record results in the Data Sheet for 3 trials of this event.

6. Add the 3 trials together and divide by 3 to find the mean or average.

Event #6: Water Bottle Flip

Materials Needed:

3 Bottles filled partly with water.
Timer

Event #6: Water Bottle Flip

Instructions:

1. Start the timer and start flipping the bottles.

2. Flip each bottle until they are sitting upright.

3. Stop the timer once you have successfully flipped all three bottles.

4. Record two decimal places on the Data Sheet for 3 trails of this event.

5. Add the 3 trials together and divide by 3 to find the mean or average.

Event #7: Clean Sweep

Materials Needed:

Broom
Golf Balls
Masking tape
Measuring tape

Event #7: Clean Sweep

Instructions:

1. Using the masking tape, mark the start line.

2. Measure a distance of 10ft (or 3m) and tape two lines that are parallel to the start line. These lines should be 12 inches long and 1 foot apart.

3. Using a broom or mop, sweep each golf ball from the start line toward the space between parallel lines. Sweep 10 golf balls. If you are reusing golf balls, sweep and measure 10 times.

4. The goal is to sweep the golf ball from the start line so that it stops between the two parallel lines. The golf ball cannot be touching any of the taped areas. 1 point is awarded for each golf ball that lands between the two lines.

5. Record results on Data Sheet for 3 trials of this event

6. Add the 3 trials together and divide by 3 to find the mean or average.

Scoring and Awards Ceremony

Once you and your family complete the events. Use the data sheets:

- Data Sheet with individual data collection.

- Score Card for athletes/participants mean measures in events.

- Step up to the Podium for gold, silver, and bronze participant for each event.
  - For each event:
    - 1st place = 10 points
    - 2nd place = 6 points
    - 3rd place = 3 points
    - All others receive 1 point

- Tally up the points to determine your overall 2020 Summer Olympics Gold, Silver, and Bronze winners.

Make your own podium and play the National Anthem! Don't forget to take pictures!

Challenge!

Create your own Olympic Event Challenge!

Make sure your event includes measurement, full directions, and description on how you collect the data.

If you have any questions about this challenge, please email teachers@oerb.com.
We would love to hear from you!

WANT TO WIN A PRIZE?

Share pictures of your Olympic Event with us by emailing teachers@oerb.com and on Facebook/Instagram by tagging us @oerbok.

Be sure to include your name, grade, school, and teacher!

The teacher with the most student submissions will win a $100 Amazon Gift Card!

Check out these additional resources!

1. "10 Insanely, Incredibly Close Olympic Finishes" by David Wallechinsky and Jaime Loucky.
    https://www.wired.com/2012/07/10-incredibly-close-olympic-finishes/

2. "7 most incredibly unexpected finishes in Olympic history" by Nicole Gallucci
    https://mashable.com/2016/08/16/olympic-finshes/

3. "The Games" – The Penn Museum
    https://www.penn.museum/sites/olympics/olympicorigins.shtml

Lesson Guide | Oklahoma Academic Standards

3.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules.

3.1.R.2 Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.

3.7.W.2 Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.

3.N.2 Add and subtract multi-digit whole numbers; multiply with factors up to 10; represent multiplication and division in various ways; Solve real-world and mathematical problems through the representation of related operations.

3.GM.2.3 Choose an appropriate measurement instrument and measure the length of objects to the nearest whole centimeter or meter.

3.GM.2.4 Choose an appropriate measurement instrument and measure the length of objects to the nearest whole yard, whole foot, or a half inch.

3.D.1.1 Summarize and construct a data set with multiple categories using a frequency table, line plot, pictograph, and/or bar graph with scaled intervals.

4.1.R.1 Students will actively listen and speak clearly using appropriate discussion rules. 4.1.R.2 Students will ask and answer questions to seek help, get information, or clarify information presented orally through text or other media to confirm understanding.

Lesson Guide | Oklahoma Academic Standards

4.7.W.1 Students will create multimodal content that effectively communicates an idea
using technology or appropriate media.

4.7.W.2 Students will create presentations using videos, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.

4.N.1 Solve real-world and mathematical problems using multiplication and division.

4.GM.2.4 Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch.

4.GM.2.5 Solve problems that deal with measurements of length, when to use liquid volumes, when to use mass, temperatures above zero and money using addition, subtraction, multiplication, or division as appropriate (customary and metric).

4.D.1.2 Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals.

5.1.R.2 Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.

5.1.W.1 Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content for audience.

5.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.

Lesson Guide | Oklahoma Academic Standards

5.7.W.1 Students will create multimodal content that effectively communicates an idea using technology and appropriate media.

5.7.W.2 Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.

5.N.1 Divide multi-digit numbers and solve real-world and mathematical problems using arithmetic.

5.GM.3.2 Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or 1/16-inch.

5.GM.3.3 Recognize and use the relationship between inches, feet, and yards to measure and compare objects.

5.GM.3.4 Recognize and use the relationship between millimeters, centimeters, and meters to measure and compare objects.

5.D.1.1 Find the measures of central tendency (mean, median, or mode) and range of a set of data. Understand that the mean is a "leveling out" or central balance point of the data.

6.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.

6.1.W.1 Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content and purpose for audience.

Lesson Guide | Oklahoma Academic Standards

6.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.

6.7.W.1 Students will create multimodal content that effectively communicates ideas using technologies and appropriate media.

6.7.W.2 Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.

6.N.2 Add and subtract integers in order to solve real-world and mathematical problems.

6.N.4 Multiply and divide decimals, fractions, and mixed numbers; solve real world and mathematical problems with rational numbers.

6.GM.3 Choose appropriate units of measurement and use ratios to convert within measurement systems to solve real-world and mathematical problems.

6.D.1 Display and analyze data.

6.D.1.1 Calculate the mean, median, and mode for a set of real-world data.

7.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.

7.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.

7.7.W.1 Students will select, organize, or create multimodal content to complement and extend meaning for a selected topic.

Lesson Guide | Oklahoma Academic Standards

7.N.2.3 Solve real-world and mathematical problems involving addition, subtraction, multiplication and division of rational numbers; use efficient and generalizable procedures including but not limited to standard algorithms.

7.D.1.1 Design simple experiments, collect data and calculate measures of central tendency (mean, median, and mode) and spread (range). Use these quantities to draw conclusions about the data collected and make predictions.

PA.N.1 Read, write, compare, classify, and represent real numbers and use them to solve problems in various contexts.

PA.D.1 Display and interpret data in a variety of ways, including using scatterplots and approximate lines of best fit. Use line of best fit and average rate of change to make predictions and draw conclusions about data.

A1.D.1 Display, describe, and compare data. For linear relationships, make predictions and assess the reliability of those predictions.

8.1.R.2 Students will actively listen and interpret a speaker's messages (both verbal and nonverbal) and ask questions to clarify the speaker's purpose and perspective.

8.1.W.1 Students will give formal and informal presentations in a group or individually, providing textual and visual evidence to support a main idea.

8.2.W.1 Students will apply components of a recursive writing process for multiple purposes to create a focused, organized, and coherent piece of writing.

8.7.W.2 Students will utilize multimedia to clarify information and emphasize salient points.

Lesson Guide | Oklahoma Academic Standards

PA.N.1 Read, write, compare, classify, and represent real numbers and use them to solve problems in various contexts.

PA.D.1 Display and interpret data in a variety of ways, including using scatterplots and approximate lines of best fit. Use line of best fit and average rate of change to make predictions and draw conclusions about data.

A1.D.1 Display, describe, and compare data. For linear relationships, make predictions and assess the reliability of those predictions.