

Unit Standards

Technology Standards (NETS for students):

1. Basic operations and concepts
 - Students demonstrate a sound understanding of the nature and operation of technology systems.
2. Social, ethical, and human issues
 - Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.
3. Technology productivity tools
 - Students use technology tools to enhance learning, increase productivity, and promote creativity.
 - Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
4. Technology communications tools
 - Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
 - Students use technology to locate, evaluate, and collect information from a variety of sources.
6. Technology problem-solving and decision-making tools
 - Students employ technology in the development of strategies for solving problems in the real world.

Mathematics Standards (Ohio Academic Content Standards):

Benchmark (Measurement: 8-10 program)

A. Solve increasingly complex non-routine measurement problems and check for reasonableness of results

F. Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions

Indicators (Measurement Units: grade 8)

1. Compare and order the relative size of common U.S. customary units and metric units; e.g., mile and kilometer, gallon and liter, pound and kilogram.
2. Use proportional relationships and formulas to convert units from one measurement system to another; e.g., degrees Fahrenheit to degrees Celsius.

Indicators (Use Measurement Techniques and Tools: grade 8)

3. Use appropriate levels of precision when calculating with measurements.

Indicators (Measurement Units: grade 9)

1. Convert rates within the same measurement system; e.g., miles per hour to feet per second; kilometers per hour to meters per second.

Indicators (Use Measurement Techniques and Tools: grade 9)

5. Solve problems involving unit conversion for situations involving distances, areas, volumes and rates within the same measurement system.

Benchmark (Measurement: 11-12 program)

- B. Apply various measurement scales to describe phenomena and solve problems.
- C. Estimate and compute areas and volume in increasingly complex problem situations.

Indicators (Use Measurement Techniques and Tools: grade 11)

5. Solve real-world problems involving area, surface area, volume and density to a specified degree of precision.

Metric Olympics

Materials:

- Cotton balls
- Plastic straws
- Paper plates
- Masking tape
- Small Post-It notes
- Large sponge
- 2 small buckets
- Funnel
- Water
- Towels
- Dry beans (usually pinto or navy)
- 4 measuring tapes (metric only if possible)
- Small balance scale
- Large graduated cylinder
- Camera (digital or video)
- Memory card or blank tape
- Sheet for recording data

Objectives:

Students will: participate in all Metric Olympic Events.
estimate potential performance in each event
record actual performance in each event.
use metric measurements to measure actual performance (unless instructed to use English system).
record measurements on their “Event Results” handout.
collect evidence of their measurements.
convert metric measurements to English (or vice-versa).
calculate difference between estimated performance and actual performance.
calculate average performances per event of their Olympic team in metric and English units.

Procedures:

1. Before competing in any events, each student will record his/her estimated performance measurements for each event. After estimating their performance students will break up into their project groups.
2. Students will compete in the “Shot Put” event by throwing a cotton ball – using proper form - and measuring/recording their throw. Make sure each competitor does not foot fault.
3. Students will compete in the “Discus” event by throwing a paper plate - using proper form - and measuring/recording their throw. Make sure each competitor does not foot fault.

4. Students will compete in the “Javelin” event by completing a standing (no running start) throw with a plastic straw and measuring/recording their throw. Make sure each competitor does not foot fault.

5. Students will compete in the “Long Jump” by completing a standing (no running start) jump and measuring/recording their jump. Make sure each competitor does not foot fault.

6. Students will compete in the “High Jump” event by holding a small Post-It note in one hand and jumping against a tall wall. Measuring/recording of the jump should be from bottom of Post-It note to the ground.

6. Students will compete in the “Squeezing” event by placing a sponge in a bucket of water. They should then transfer the sponge to a new bucket and squeeze as much water out of the sponge as they can in a one-handed steady squeeze (no re-gripping and squeezing again). After the water is transferred by funnel into the graduated cylinder measuring/recording of the squeeze should take place.

7. Students will compete in the “Grabbing” event by reaching into a tub of dry beans and pulling out only what they can hold in one hand. Using a balance scale, the weight (mass) of the beans should be measured/recorded.

8. After all group members have competed in all events, the members will gather to convert all measurements to the same unit by applying the applications formulated from the previous lessons.

9. The students will then subtract to find the differences between their estimated performances and their actual performances.

10. Using the differences, each group will find an average performance for each event.

11. Olympic medals will be given to the groups whose estimated and actual performances were the closest.

Event Results

Cotton Ball Shot Put

Estimate _____
Actual _____
Conversion _____
Difference _____
Average _____

Paper Plate Discus

Estimate _____
Actual _____
Conversion _____
Difference _____
Average _____

Plastic Straw Javelin

Estimate _____
Actual _____
Conversion _____
Difference _____
Average _____

Standing Long Jump

Estimate _____
Actual _____
Conversion _____
Difference _____
Average _____

High Jump

Estimate _____

Actual _____

Conversion _____

Difference _____

Average _____

Bean Grab

Estimate _____

Actual _____

Conversion _____

Difference _____

Average _____

Plastic Straw Javelin

Estimate _____

Actual _____

Conversion _____

Difference _____

Average _____