Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

2275 Speedway, Mail Code C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

Dinosaur Tracks

Lesson Plan for Grades: Elementary
Length of Lesson: 1 hour and 30 min

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Subject area/course:

- Paleontology, Earth, Geology, Environment, Mathematics

Materials:

- Dinosaur Trackway Handouts
- Ruler
- Scissors
- Sponges
- Dinosaur Tracks Templates
- Paper Towels
- Paper Plates
- Hot Glue Gun
- Rubber Bands
- Popsicle Sticks
- Card Stock
- Washable Paint
- Post-its

TEKS/SEs:

§111.3. Mathematics, Grade 1
(7) Geometry and measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

- (A) use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement;
- (B) illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other;
- (C) measure the same object/distance with units of two different lengths and describe how and why the measurements differ;
- (D) describe a length to the nearest whole unit using a number and a unit.

§112.15. Science, Grade 4
(3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:

- (C) represent the natural world using models such as rivers, stream tables, or fossils and identify their limitations, including accuracy and size.

Lesson objective(s):
Students will:

- Create their own dinosaur trackways.
- Learn differences between a step and a stride.
- Use measuring tools to determine step and stride size using a number and unit.

Differentiation strategies to meet diverse learner needs:

- The teacher should ask students whether they prefer to read or watch videos to learn about concepts; then have students learn in their preferred learning style. However, the teacher may assign students certain methods to improve their skills. For example, if a student prefers reading, teachers may have them watch a video and take notes to improve their listening skills.
- ELL students and students with learning disabilities should have multiple forms of instruction including visual and written instruction sheets as well as a verbal instruction and demonstration.

ENGAGEMENT (45 minutes)

- Prior to class, teacher prepares dinosaur sponge feet. Teacher directs students to divide into groups and create

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a track of dinosaur footprints with the materials provided.

EXPLORATION (15 minutes)

- Teacher introduces idea of steps and strides. Have students discuss in their teams, what is a step and what is a stride?
  - A step is the distance from the heel of left foot to heel of right foot. A stride is the distance from the heel print of one foot to the heel print of the same foot.
  - Consider using the *SciGirls* video: "Horsing Around" to see difference between steps and stride (17:48 – 18:20): www.youtube.com/watch?v=34BXV9SFgpw.
- Teacher allows groups to work together in measuring steps and strides in centimeters and then in inches.
  - Teacher walks around to make sure students are measuring appropriately and understand the concepts of steps and strides.
  - Students should be recording their observations on their trackway by writing their measurements with their corresponding animal for both the step and the stride.

EXPLANATION (15 minutes)

- The teacher discusses with class how they measured the steps and strides in their dinosaur tracks.
- Teacher leads a discussion with the entire class.
  - Why are correct measurements important?
  - How can incorrect measurements affect our everyday lives?
- Students look at the animal they compare to depending on step and stride size.
- Teacher creates a table for step and stride listing all the animals in the "Dinosaur Trackway" handout. Each team puts a post it for the animal they are based on their step and stride size.

ELABORATION (15 minutes)

- Teacher leads discussion about class results regarding the animals represented based on step and stride size.
- Teacher talks about types of scientists who study trackways & fossils & why they are important. Consider showing highlights of *Hot Science – Cool Talks* #103 as Dr. Kirk discusses paleontology, fossils and West Texas:
  - Types of scientists – anthropologists, paleontologists, evolutionary biologists, computer scientists.
  - How do certain types of animals can help us determine the type of climate and environment?
  - Discuss measurements and how important they are in science and math.

EVALUATION (throughout entire lesson)

Teacher should:

- Make sure that the students are measuring properly.
- Ask questions to provide insight into the students' progress.
- Ensure all students have a chance to understand and ask questions.

Students should demonstrate understanding of:

- Measurements and their knowledge of future applications
- STEM careers: paleontology, anthropology

SOURCES AND RESOURCES

- **Dr. Christopher Kirk's *Hot Science – Cool Talks* #103 "Some Like It Hot, Hot, Hot: When Primates Roamed Texas' Rainforests"**, www.hotsciencecooltalks.org
- **Dr. Gregory Price, School of Geography, Earth and Environmental Sciences**, Plymouth University**; Dr. Rowan Martindale, Dr. William Foster & the Martindale Invertebrate Paleontology Lab**, UT Austin;
- ***SciGirls*, "Horsing Around",** www.youtube.com/watch?v=34BXV9SFgpw
- ***Dinosaur World,*** *"Dinosaur Evolution" poster,* www.dinosaur-world.com/

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ENGAGEMENT ACTIVITY (45 minutes)

Purpose: Create a miniature dinosaur "trackway" to later measure steps and strides.

Materials:

- Scissors
- Sponges
- Dinosaur Feet templates
- Hot Glue Gun
- Rubber Bands
- Popsicle Sticks
- Card Stock
- Washable Paint

Safety Information: N/A

Procedure:

Prior to class:

1. Create dinosaur feet, enough for all the groups in your class (at least two students per group):
    a. Cut out dinosaur feet shapes from sponges using template provided.
    b. Hot glue the end of a popsicle stick to the sponge.
    c. Place paint in Paper Plates and assign 2 students to a paper plate and a pair of dinosaur feet.
    d. Assign each group of students two trackways (construction paper).
2. Demonstrate activity to the class.

Activity Instructions:

1. Attach the dinosaur feet to your index fingers with rubber bands.
2. Lock your thumbs and have only your index fingers out.
3. Dip your dinosaur feet in paint.
4. Carefully "walk" on your trackway (cardstock) with your dinosaur feet, trying not to smear the footprints.
5. Put your dinosaur feet on a paper towel to dry.
6. Let your trackway dry and put materials back to where the teacher tells you to.

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EXPLORATION ACTIVITY: Student Handout: (15 minutes)

What is the difference between a step and a stride?

1. *Use the ruler to figure out the size of your dinosaur steps and strides in centimeters and inches.*

2. *Use the Dinosaur Trackway chart and find your matching animal for your step and stride.*

What Is Measured	Measurements in centimeters (cm)	Measurements in inches (in)	Animal / Dinosaur
Step			
Stride			

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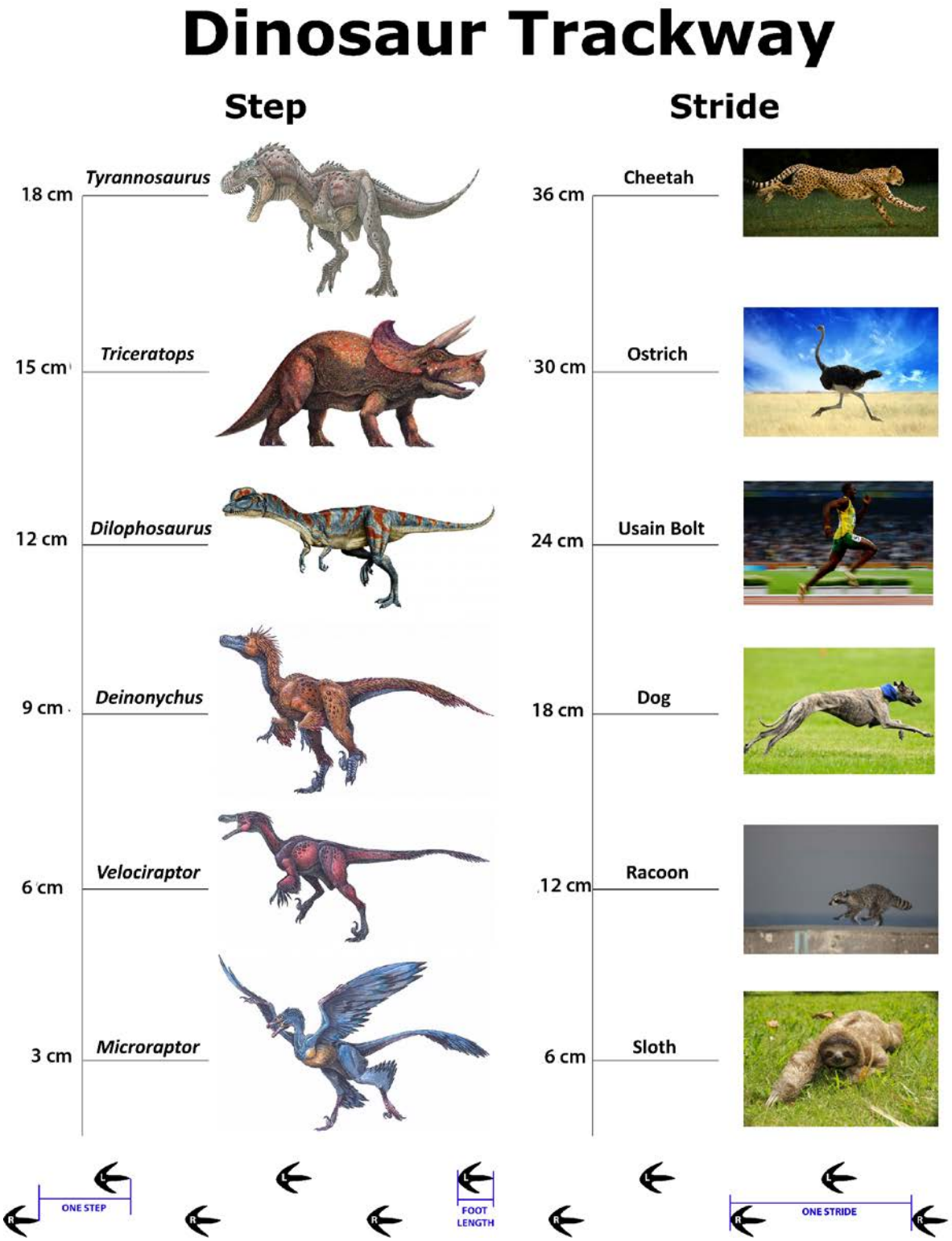

Source: *"Dinosaur Evolution"*, www.dinosaur-world.com

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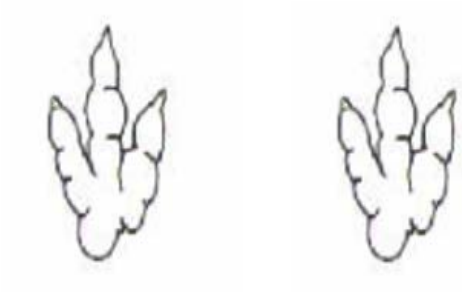
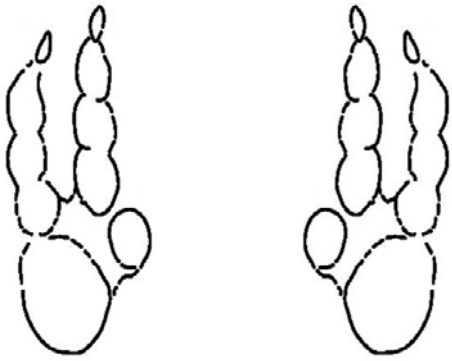
Dinosaur Feet Templates:

Amblydactylus



Eubrontes giganteus

Eubrontes glenrosensis



Velociraptor