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Tiny Sparks: Science and Storytelling in Early Learning

Lesson Title: Dino Detectives: Digging Up Discoveries!

Grade Level: Preschool
Lesson Length: 50 minutes

AZ Science Standard:	E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.
Learning Objective:	● Students will be able to use simple tools (brushes, spoons) to carefully explore and investigate hidden objects in a simulated excavation environment. ● Students will be able to describe basic characteristics of fossils by creating imprints and discussing how scientists learn about prehistoric animals through fossil evidence.

Vocabulary	Materials
● Paleontologist ● Dinosaur ● Excavate ● Fossil	● The book "Digging up Dinosaurs" by Aliki ● Plastic dinosaurs ● Air dried clay, Playdough or salt playdough ● Sensory bin with filler ● Laminated dinosaur fossil skeleton and dinosaur image ● Brushes for excavation

Costume Element:
Costumes play a vital role in storytelling by engaging children in immersive experiences, visually representing characters and concepts, and boosting cognitive skills through interactive play. They encourage creativity and support multi-sensory learning, making scientific concepts more accessible and memorable for young learners.

- **Safari hats or hard hats**: Symbolize exploration and safety.
- **Safety glasses or goggles**: Emphasize protection during scientific activities.
- **Flannel shirts, outdoor vest, or lab coats**: Represent the role of a geologist. The pockets on the vest can also hold rock type for hands-on exploration.
- **Backpacks or toolboxes**: Carry essential tools like magnifying glasses and rock hammers.
- **Work gloves**: Highlight hands-on exploration and safety.
- **Compass and notebook**: Add authenticity to the geologist role

Guiding Questions:
- What kind of scientist studies rocks?

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- What is a fossil?
- What kind of scientist studies fossils?
- How do scientists learn about dinosaurs that lived a long time ago?
- What might a fossil tell us about an animal that lived long ago?

Engagement/Introductory Activity:

- Gather children in a circle
- Introduce the book "Digging up Dinosaurs" by Aliki
- Show the cover and ask children what they think the story might be about

Exploratory Activity:

Introduction (5 minutes)

- Gather students in a circle and introduce the book "Digging Up Dinosaurs" by Aliki.
- Briefly explain that the book talks about how scientists find and study dinosaur fossils.

Storytelling (15 minutes)

- Read "Digging Up Dinosaurs" aloud to the class, showing the illustrations.
- Pause occasionally to ask simple questions about what they see and what they think might happen next.
- After reading, discuss how paleontologists work and what fossils are.

Science Activity: Dinosaur Excavations (15 minutes)

- Divide students into small groups.
- Provide each group with a shallow tray or sensory tray filled with sand, soil, or rice filler.
- Hide dinosaur bones fossils parts in the sensory tray.
- Give each student a small brush and plastic spoon to act as excavation tools.
- Let students carefully dig and brush away the sand to uncover their dinosaur fossils.
- Have the students place each fossil on the dinosaur skeleton image.
- Once all fossils have been found, the skeleton image will be complete.
- Students can switch to excavate different dinosaur boxes.

Art Activity: Fossil Imprints (10 minutes)

- Give each student a small ball of playdough or salt dough.
- Provide plastic dinosaurs and demonstrate how to press the objects into the dough to create imprints.
- Plastic dinos can be pressed into the clay on their side, or with their feet and tails.
- Encourage students to make their own fossil imprints.

Conclusion (5 minutes)

- Gather students back in a circle.
- Invite a few volunteers to share their fossil imprints and explain what they discovered.
- Recap how paleontologists find and study fossils to learn about dinosaurs.

Explain:

- "Can you tell me what you found when you were digging in the sensory bin?"
- "How did it feel to use the brush and spoon to uncover the dinosaur fossils?"
- "What shape did you see when you pressed the dinosaur into your playdough?"
- Were any bones missing in your excavation? Why do you think that is?
- What do scientists at museums do with dinosaur skeletons that have missing bones?
- "What do you think was the most interesting thing we learned about how scientists study dinosaurs?"

Extension Activity/Questions:

"Future Fossil" Time Capsule:

- Discuss with students how fossils are like messages from the past.
- Have each student choose a small object that represents them (e.g., a toy, a drawing).
- Provide each student with a small container (like a plastic egg) filled with playdough.
- Help students press their object into the playdough to create an imprint, then remove the object.
- Seal the containers and create a classroom "time capsule."
- After a set time (e.g., end of the school year), open the time capsule and have students try to identify each other's "fossils."

Evaluation Activity:

Enlist the teacher’s help to record the following data as needed. Use the following combination of formative and summative assessment methods:

Observational Assessment:

- During the storytelling and activities, observe students' engagement and responses to questions about fossils and paleontologists.
- Take notes on students' comments and actions during the mini excavation to gauge their understanding of the excavation process.

Performance-Based Assessment:

- Evaluate students' ability to use the brush and spoon tools carefully during the excavation activity.
- Assess their fossil imprints, looking for evidence that they understand how fossils are formed.

Informal Questioning:

- During the conclusion, ask open-ended questions about how scientists learn about dinosaurs and what fossils can tell us.

Dinosaur Matching Game:

- Create a simple matching game where students pair dinosaur toys with their corresponding fossil imprints, assessing their ability to recognize and compare shapes.

Group Discussion:

- Lead a brief group discussion where students share what they learned about paleontologists and fossils, noting their use of new vocabulary and concepts.