

**ITQ ARTS AND SCIENCE INTEGRATION
GRADE 4
DANCE AND EARTH SCIENCE**

**Settle it Down - Deposition
Lesson #3**

Teach *FOSS California*, Grade 4, Solid Earth, Investigation 5, "Landforms", Part 3, *Deposition*

CONTENT STANDARDS

Dance Grade 4

- 2.1** Create, develop, and memorize set movement patterns and phrases.
- 2.4** Create a dance study that has a beginning, a middle, and an end. Review, revise, and refine.

Earth Science Grade 4

- ES5c** Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition.)

ESSENTIAL QUESTIONS (*Questions students might ask about the topic*)

- What is deposition and how can I show deposition, erosion and weathering through creating a three-part ABC dance?

OBJECTIVES & STUDENT OUTCOMES (*Students will be able to.....*)

- distinguish between weathering, erosion, and deposition
- create and perform a three-part dance showing weathering, erosion, and deposition

ASSESSMENT (*Various strategies to evaluate effectiveness of instruction and student learning*)

- **Feedback for Teacher**
 - Student response to inquiry
 - "Performance Rubric: Weathering, Erosion and Deposition Dance Study"
 - Student revision of work
 - "Where would you build your home?" worksheet
- **Feedback for Student**
 - Feedback from teacher
 - Feedback from peers
 - Viewing Videotape
 - "Performance Rubric: Weathering, Erosion and Deposition Dance Study"
 - "Where would you build your home?" worksheet

WORDS TO KNOW

Dance

- **ABC Form:** A three-part compositional form in which the second and third sections contrast with the first section.
- **Contrast:** To set side-by-side to emphasize differences.
- **Dance Study:** A short work of dance that investigates a specific idea or concept and shows a selection of movement ideas.

Science

- **Deposition:** The settling of sediments.
- **Landform:** A feature of the land, such as a mountain, canyon, or beach.

- **Sediment:** Pieces of weathered rock such as sand, deposited by wind, water, and ice.

MATERIALS

- 7 pieces each of 4' square fabric: 1 piece dark blue (water), 1 piece light blue (frozen water), 2 pieces green (rocks), 1 piece red (acid rain), and 1 piece yellow (wind), 1 piece white (glacier)
- "Deposition Instruction Sheet" (included)
- "Where Would You Build Your Home" worksheet (included)
- Performance Rubric (included)
- CD Player and music
- Video Camera

RESOURCES

- Deposition Facts for Kids @ http://www.ehow.co.uk/info_8512606_deposition-kids.html
- StudyJams Weathering and Erosion @ <http://www.youtube.com/watch?v=lyysL02ZvQ8>
- "How to do the Cat Daddy", youtube, <http://www.youtube.com/watch?v=vPu4BbB4StI>
- Glaciers 101 @ www.homepage.montana.edu/.glaciers101.htm

PREPARATION

- Students should have watched the video of their two-part dance and made revisions based upon feedback. Students should have the two parts memorized prior to this lesson.
- Watch "StudyJams Weathering and Erosion" video on youtube.
- Teach *FOSS California*, Grade 4, Solid Earth, Investigation 5, "Landforms", Part 3, *Deposition*
- Science Notebooks, 1/student
- Make one copy of each "Deposition Instruction Sheet".
- Have pieces of fabric, music, CD player and video camera ready.
- Plenty of space to move freely and safely.

WARM UP *(Engage students, access prior learning, review, hook or activity to focus the student for learning)*

(5 minutes)

- Rehearse parts A and B from lessons 1 and 2.
- *Say: In the last three weeks we learned about weathering and erosion. Today we will learn about **deposition**.*
- *Say: The process of weathering, erosion and **deposition** are ongoing. Neither process ever really stops. The surface of the Earth is constantly breaking down, moving around and **depositing** to create new **landforms**.*
- Teach the chant: Break it down, move it around, deposit, deposit.
 - *Add movements:*
 - *Cat daddy*
 - Shift weight to the left leg, face right and do a double arm circle while changing level two times to a medium high level and a medium low level, *beats 1 and 2 (break it down)*. Steps should be done with a bounce.
 - *Step-together-step (or walk, walk, walk), beats 3 and 4 (move it around)*
 - *Clap and slap ground two times, beats 5 through 8 (deposit, deposit)*.

MODELING *(Presentation of new material, demonstration of the process, direct instruction)*

(15 minutes)

- Post dance vocabulary words: **ABC Form, contrast, dance study, deposition, sediment, landform**
 - *Say: Today we will be finishing our dances by creating a **dance study** about weathering, erosion, and **deposition**. We call it a **dance study** because we are focusing on one topic, and creating and arranging movement specifically to show that topic.*
 - *Our **dance study** will have a beginning, a middle, and an end. We will write our dances just as an author writes a story.*
 - *Say: as you recall from last week's lesson speeds or movements that are different from each other is called **contrast**. Parts of a dance that are different from each other are contrasts.*

- Say: *The third part of our dance will demonstrate **deposition**.*
- Ask: *If our dance from last week was in the form AB, what is the form after we add this new part?* [Guide students to understand that since deposition is a new idea, then a new letter, C, will represent the next section of the dance. The form will now be ABC.]
- Ask: *What do you remember about **deposition** from our stream-table experiment?* [Accept student answers.]
- Say:
 - **Deposition** is the settling of **sediments** such as clay and sand. In our stream-table, we saw the eroded earth material (bits of rock, clay and sand) end up at the bottom of the slope. The sand formed a fan-like deposit while the clay stayed with the water and moved further downstream.
 - Using your hand, wave quickly like a flowing river. Gradually slow down and finish with fingers spread apart.
 - Have students mimic the movement and when the fingers are spread, have them say delta.
 - This fan-like deposit at the mouth of a river is called a delta. A delta is a type of **landform** that did not exist until the flowing of the water (as in a river) eroded (moved) the sand taking it from one place and **depositing** it in another place (the mouth of a river). Slowing water, wind, and melting glaciers deposit rocks. Deposition, along with weathering and erosion are responsible for continually reshaping of the earth's surface. **Sediment** is constantly being weathered and carried away by erosion and deposited in a different place. Usually this is a slow process.
 - Wind can also create a **landform** known as a sand dune. Heaps of sand are blown into one location where they are piled on top of each other to create a hill of sand.
 - Arrange students in small groups of four to six in a sitting position.
 - Say: *Once your hand is placed in the sand dune, you cannot remove it.*
 - One at a time, have students stack their hands on top of each other.
 - Ask: (When the exercise is complete), *What **landform** did the stacking of our hands represent?* [Sand dune]
 - **Glaciers** move very, very slowly pushing along all sizes of rocks, pebbles sand and clay and **depositing** them at the bottom of a mountain slope. When the **glacier** melts, it leaves a scattering of debris all over the place.
 - Teacher Note: A **glacier** moves about one foot per year. In order to get the students to understand how slowly a glacier moves, consider using the example of relating movement to birthdays.
 - Say: *Every year when I have a birthday, a **glacier** moves only one foot. A whole year goes by and the glacier moves another foot.*
 - Repeat this several times moving forward only one foot as you talk about having a birthday.

GUIDED PRACTICE (Application of knowledge, problem solving, corrective feedback)

Creating part C of the dance:

(5 minutes)

- Distribute a "**Deposition** Instruction Sheet" (sand dune, delta, **glacier**) to each group.
 - The group who does erosion by glacier receives "Deposition Instruction Sheet #1".
 - The group who does erosion by wind receives "Deposition Instruction Sheet #2".
 - The group who does erosion by water receives "Deposition Instruction Sheet #3".
- In their group have students read the introduction and discuss the questions. Move from group to group to check for understanding.
- Remind students that the same people who portrayed the rock, shape, the weathering rock and the scarves remain in the same role.

(5 minutes)

- Once students have an understanding, ask them to explore movement for part C of their dance. Move from group to group to check that students are using appropriate speed for rocks, pebbles and sand.
- Also check to make sure the student with the eroding agent (wind, ice, and water) are directing the students as the rocks, pebbles and sand away from the original rock and toward an open space where they can form the delta, sand dune or littering of debris.

(3 minutes)

- Distribute the colored pieces of fabric to each of the three groups. One group will perform **deposition** by wind (yellow fabric), water (dark blue fabric), and frozen water/ice (**glaciers**, the white fabric.)

- Say: Think about the speed, the direction and the distance each of your three pieces of rock will travel in part C of your dance. How fast or how strong will your **deposition** be? How will you transition from erosion to **deposition** to your **landform** (delta or sand dune) or debris deposit?

(7 minutes)

- Have students create part C of their dance. Once part C is completed, stop all movement.
- Say: Now that you have completed part C of your dance, connect it to parts A and B. You will perform part A, B and C without stopping.

(5 minutes)

- Students rehearse putting all three parts together.
- Move among the groups and coach.
- Select and play appropriate music.
- Videotape each performance. Use the "Performance Rubric: Weathering, Erosion, and Deposition Dance Study" to evaluate group performance.

DEBRIEF & REFLECT (Identify problems encountered, ask and answer questions, discuss solutions and learning that took place. Did students meet outcomes?)

(5 minutes)

- Have students record in their science notebook:
 - Describe how we show **deposition** in our dance.
 - How did we show contrast and ABC form in our dance?
 - How did dance help me to understand the weathering process?

EXTENSION (Expectations created by the teacher that encourage students to participate in further research, make connections, and apply understanding and skills previously learned to personal experiences.)

- Complete science notebook and all questions.
- Watch video and apply performance rubric to revise and improve the dance study.
- Create a storyboard and illustrations for your science notebook showing the process of weathering, erosion and deposition.
- Combine all three dances into a collage and perform before a live audience. Or show the video collage at open house.

Performance Rubric Weathering, Erosion and Deposition Dance Study

4 – All three parts are clearly seen. The agent is clearly observed and performed (wind, water, or ice). The dance is memorized and performed without hesitation. Students need no coaching from the teacher. The group cooperates well together. The dance ends in stillness.

3 – All three parts are clearly seen. The agent is clearly observed but the movement may not be clear. The dance is mostly memorized and may show some hesitation. Students might need to stop, discuss briefly or receive prompting from the teacher. The group cooperates well together. The dance ends in stillness.

2 – All three parts are clearly seen. The agent is observable by the color of the scarf but the movement may not be clear. Students may have difficulty with memorization and may hesitate several times or may even stop and start over. Not all members of the group are fully engaged. The dance ends in a brief still shape.

1 – All three parts may not be completed. The agent is observable but the movement is not clearly defined. The dancers have difficulty getting through the dance without coaching or stopping and starting. The dance has no clear ending.

Group	Clarity	Performance	Comments
Frozen Water/ Glacier	Form ABC Contrasting Movement Weathering Agent Eroding Agent Deposition and Ending Shape 4 3 2 1	Memorized Smooth Transitions Focus and concentration 4 3 2 1	
Roots and Wind Group	Form ABC Contrasting Movement Weathering Agent Eroding Agent Deposition and Ending Shape 4 3 2 1	Memorized Smooth Transitions Focus and concentration 4 3 2 1	
Chemical Weathering and Roots and Water	Form ABC Contrasting Movement Weathering Agent Eroding Agent Deposition and Ending Shape 4 3 2 1	Memorized Smooth Transitions Focus and concentration 4 3 2 1	

Deposition Instruction Sheet #1 DEPOSITION BY GLACIER (ICE)

READ: As glaciers move, they plow up everything in their paths. They bulldoze trees they drag rocks, and they carve valleys. A gliding glacier picks up sand, pebbles, and boulders. The rubble sticks to the bottom of the glacier and as the glacier moves, it very slowly pushes debris down the mountain. When a glacier begins to melt, it litters the ground with rocks and sand.

1. How can you show a slow moving glacier pushing along and depositing sediments of various sizes (large, medium and small)?
2. Create a minimum of 16 beats of movement to form a cluster of different sized rocks.
3. Create an ending shape for everyone in your group (the person with the scarf (ice), the people in the original rock shape, and the people (as the eroded rock) at the end of the glacier.
4. Connect part C to parts A and B.
5. Rehearse all parts (ABC) at least 3 times.



Several different sized rocks and sand were pushed along and deposited by a glacier.

Deposition Instruction Sheet #2

DEPOSITION BY WIND

READ: Breaking up a mountain makes lots and lots of sediment. It all has to go somewhere. The force of wind carries it to new places. That builds up whole new landscapes. Weathering and erosion have whittled away the rocks there for millions of years. Wind picks up lighter forms of sediment, such as dust and sand, and deposits them as it slows. In the desert, the wind creates sand dunes. If you go to the Imperial Valley, near El Centro, you will find very large sand dunes!

1. How can you show:
 - a. Quick moving wind?
 - b. Swirling, and flying dust and sand?
 - c. The wind dieing down, the dust and sand settles and builds up on top of each other to form a sand dune?
2. Create a minimum of 16 beats of movement to form a sand dune.
3. Create an ending shape for everyone in your group (the person with the scarf (water), the people in the original rock shape, and the people (as the eroded rock) of the delta.
4. Connect part C to parts A and B.
5. Rehearse all parts (ABC) at least 3 times.



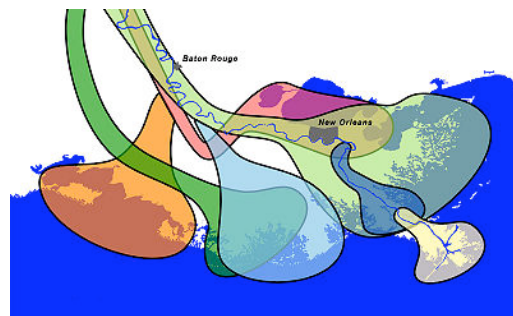
Deposition Instruction Sheet #3 DEPOSITION BY WATER

READ: As rivers carry dust, pebbles, and rocks downstream, this material is eventually deposited at some location further downstream. These deposits form at bends in a river, as well as in locations where slowing rivers dump water into lakes, seas, and oceans. A new landform is formed called a delta. The sediment slowly builds up and creates new wetlands and deltas at the mouth of the river. The swamps of Louisiana are good examples of sediment carried by the Mississippi River and collected at the end.

1. How can you show:
 - a. A river moving sediments swiftly downstream?
 - b. The river gradually slowing down?
 - c. The sediment settling and building up on top of each other to make a fan-like delta?
2. Create a minimum of 16 beats of movement to form a delta.
3. Create an ending shape for everyone in your group (the person with the scarf (water), the people in the original rock shape, and the people (as the eroded rock) of the delta.
4. Connect part C to parts A and B.
5. Rehearse all three parts (ABC) at least 3 times.



A delta in Okavango, Botswana, Africa showing fan-like deposits at the mouth of the Niger River.



Seven Different deltas at the mouth of the Mississippi River in Louisiana.



**WETLANDS ARE SOMETIMES
CREATED AT THE MOUTH
OF A RIVER.**