

**Virginia Essentialized Standards of Learning (VESOL)  
Instruction Resource  
Science Sample Activities**

**Grade 5 Science Earth/Space Systems and Earth Resources (ESSER)**

VESOL Code	VESOL Reporting Category	VESOL Text	Complexity Continuum
S-5 5	Earth/Space Systems and Earth Resources (ESSER)	Recognize and compare objects in the solar system and their features.	Using simple pictures, diagrams, or representations, concepts could range from: <ul style="list-style-type: none"> <li>• recognizing the sun and Earth as compared to common unrelated objects on Earth <i>to</i></li> <li>• recognizing the sun and Earth as compared to other objects in the solar system <i>to</i></li> <li>• comparing simple physical characteristics (e.g., size, shape) of objects in the solar system.</li> </ul>

**Instructional Example**

**Objective:**

Identify and compare objects in the solar system

**Vocabulary:**

sun, earth, solar system, planets

**Materials:** *Sample activities range across a continuum of complexity and may include materials such as:* tangible 3-D objects including, earth, sun, vehicle, animal, food and toy pictures of earth, sun, vehicle, animal, food item and toy; moon and stars laminated planet cut-outs and sun, laminated blue sky response board, Velcro, dry erase marker, eraser cloth or tissue

### **Procedures for Instruction:**

*These instructional activities can be used at various points on the complexity continuum, depending upon student ability. Many possibilities exist for lesson creation between the examples presented here. It is important to start instruction where students are currently functioning and implement the appropriate instructional strategy with them. Once data indicate that the student is ready for the next level of instruction, proceed to it after reviewing the level the student has mastered. Let the data be your guide.*

### **Sample Activity 1-** Initial concept instruction using real objects and [Discrete Trial Teaching](#)

#### Phase 1:

- Place the earth model on the table/student desk. Touch and say “earth”
- Give direction, “show me earth.” Use [least-to-most prompts](#) to ensure the student touches “earth.”
- Repeat massed trials (sets of 5-10) until the student touches earth with minimal prompts 80% of trials. Each time the student responds correctly, provide feedback, “Yes, earth is our planet in the solar system.”
- Introduce distractor. Place the vehicle beside the earth. Touch and say “earth.”
- Give direction, “show me earth.” Use least to most prompts to ensure the student touches earth.
- Repeat massed trials (sets of 5-10) interchanging placement of truck and earth in the two fields until the student touches earth with minimal prompts 80% of trials. Each time the student responds correctly, provide feedback, “Yes, earth is our planet in the solar system.”
- Introduce additional distractors, such as animals, to create a choice field of 3. Touch and say “earth.”
- Give direction, “show me earth. Use least-to-most prompts to ensure the student touches earth.
- Repeat massed trials (sets of 5-10) interchanging field placement of earth, truck and animal until student touches earth with minimal prompts 80% of trials. Each time the student responds correctly, provide feedback, “Yes, earth is our planet in the solar system.”

#### Phase 2:

- Repeat above procedure, substituting “sun” for earth and using food and toy distractor items, rather than vehicle and animal, until the student touches the sun with minimal prompts 80% of trials. Each time the student responds correctly, provide feedback, “Yes, the sun gives the earth warmth and light in our solar system.”

#### Phase 3:

- Randomized trials: Place three items on the desk/table, one of which is the earth or sun. Give direction, “Show me earth” or “show me sun.” Use least-to-most prompts to ensure students touch “earth” or “sun” 80% of trials. Provide affirming feedback each time the student selects correctly, either “Yes, the earth is our planet in the solar system,” or “Yes, the sun gives the earth warmth and light in our solar system.”

#### Phase 4: Generalization

- Place three items on the table/student desk. Model successful task completion: Give instruction, “Show me which is in our solar system,” then select earth or sun. Provide a verbal model, “The earth/sun is part of our solar system. Your turn”
- Repeat trial using least-to-most prompts as the student makes the selection. Repeat massed trials (sets of 5-10) interchanging field placement of the objects until the student selects either earth or sun as parts of our solar system 80% of trials. Provide feedback each time the student selects correctly, Yes, the earth is our planet in the solar system,” or “Yes, the sun gives the earth warmth and light in our solar system.”

Note: Encourage student communication with each trial. For example, when the student selects the sun correctly, let them hold it, say “Yes the sun gives the earth warmth and light in our solar system” and ask, “What is this?” so that students can verbalize or use their communication system to express the word “sun.”

**Sample Activity 2**– initial concept instruction using pictures and [Discrete Trial Teaching](#)

Same as above, except use pictures rather than 3D objects, and introduce distractors with similar attributes (such as a picture of a ball, which is similar in shape to the earth or lemon which is similar color to the sun).

**Sample Activity 3** – concept instruction using related discrimination and [Discrete Trial Teaching](#)

Same as above, except use solar system distractors, such as moon and star, rather than unrelated items.

**Sample Activity 4** –order of planets instruction using concrete representations [task analysis and backward chaining](#).

Download and mount free printable planets onto cardstock and cut. Create blue cardstock response mats with yellow sun in the left-hand corner and Velcro sticky coins mounted for placement of each of the planets in relation to the sun.

Provide a model of completed mat displaying planet order. Use least-to-most prompts for student to successfully name and place Velcro-backed planet cut-outs to match model (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune)

Use [backward chaining](#) to teach independent ordering of the planets, using physical features of each planet as a cue for where it belongs.

- Teacher places the first seven planets on the mat, and says, “The last planet is Neptune! Put Neptune at the end! We did it! Here are all the planets! Let’s say them together!” Teacher and student name all the planets, and their unique traits, in order.
- With student mastery of Neptune, repeat the procedure, this time asking the student to select Uranus from the field of two, using least-to-most prompts and match it to a temporary physical shape outline drawn with a dry erase marker
- Complete in like fashion, adding previous planets (paired with a temporary shape outline made with dry erase marker and verbal description) until the student places each of the eight planets in order, matched to planet shape outlines. Provide affirmative feedback, (such as “That’s

right! Neptune is shaped like a ball and is after Saturn which has a ring. You did it!") as students arrange planets correctly

- Repeat procedure above, fading the shape outlines, and using least-to-most prompts as the student places the planets in correct order, from Mercury to Neptune, naming the planet and physical feature that defines it. Provide positive feedback for each correct answer, and name the planet and its feature each time a student adds it to the mat.
- Fade prompts until the student places 80% of planets in correct order 4/5 trials over two consecutive weeks.
- **Generalization:**  
Provide a field of three pictures showing planet order (named or unnamed) and ask the student to select which picture displays the correct order of the planets. Students may need additional instruction to transfer knowledge gained with 2D planet representations to pictures.

Note: For students for whom mnemonics are effective, let students check their work using this mnemonic, "My Very Educated Mother Just Served Us Nachos."

### **Additional Resources:**

#### **Evidence-Based Instructional Practices:**

[Evidence-based Practices for Students with Significant Cognitive Disabilities](#)

[Discrete Trial Teaching AFIRM module](#)

[Discrete Trial Teaching Implementation Checklist](#)

[Least-to-Most Prompting](#)

[Task Analysis Step-by-Step Guide](#)

#### **Solar System Instruction Resources:**

[Perkins Learning Accessible Science multi-sensory tour of our solar system](#)

[Put the Planets in Order Velcro Activity](#)

[Planet Image Cards](#)

[TTAC Online ASOL Solar System Sample Activity](#)

[BrainPop Solar System](#)

[Smithsonian Solar System Virtual Exhibits](#)

[PBS Learning Media: Solar System](#)

[Children's University: Ordering the Planets](#)

[Planet Order Song](#)

[The Planet Song](#)

[NASA Science Space Place](#)

#### **Communication:**

- [36 Location Universal Core Board](#)
- Core Vocabulary and Science: Core words that can be modeled and targeted during lessons:
  - like (shaped **like** a ball)
  - Turn
  - Up
  - Where?
  - Big/Small
  - It
  - Look/see

