

Language of Science

FIRST Determine English Proficiency Level

Evaluate your students' English proficiency and choose activities on the following pages that match their levels.

Beginner Level

Students may be silent and may or may not understand the science concepts.

You should:

- encourage yes/no answers.
- have students point to responses.
- allow one-word answers.
- model science activities.
- label all science equipment.

Early Intermediate Level

Students will have some English skills but will not know science vocabulary.

You should:

- help students construct simple sentences when responding.
- allow students to describe things orally but model written responses.
- encourage cooperative group tasks.

Intermediate Level

Students' oral and written skills are developed but they may struggle to use science terms.

You should:

- model grade-level science vocabulary and usage.
- encourage higher-level thinking skills, such as hypothesizing and summarizing.
- allow students to explain new science terms in their own words.

NEXT Select Picture Pack Cards

Refer to the *Teacher's Resource Guide* (TRG) for lists that pull together Picture Pack Cards in the following categories.

- Habitats, TRG p. 30
- Seasons, TRG p. 30
- Living Things, TRG p. 30

- Nonliving Things, TRG p. 30
- Fruits, TRG p. 30
- Vegetables, TRG p. 31

- Weather, TRG p. 31
- Science Topics by Grade Level, TRG p. 31

Professional Development Notes



What the Research Says ...

Inquiry-based instructional methods are often very successful when teaching science to ELLs.

- * **Hands-on activities** help students to see and experience what they are learning.
- * **Prior knowledge** can help students learn the language that they need in a science classroom. Make efforts to create connections to that prior knowledge.
- * **Group work and inquiry** opportunities go well together. Group work gives ELLs many opportunities to read, listen, talk, and write about experiences.

For further research,



Fathman, A. K., and Crowther, D.T. (2006). *Science for English Language Learners: K-12 Classroom Strategies* NSTA.



ELL Best Practices

Seating Arrangement In a general classroom, seat ELLs so that they are surrounded by native speakers. This gives the ELL student an opportunity to see what other students are doing and to mimic appropriate behaviors when they are unsure of what to do.



TESOL Standards

The activities on this card will help students meet these standards.

- 2.1** Interact in the classroom
- 2.2** Provide subject matter information
- 2.3** Apply academic knowledge

Beginner Level Activities

Guided Instruction

IDEA 1 Words and Pictures Respond to yes/no questions about science concepts.

1. Choose groups of four or five related cards.
EXAMPLE things that move, plants, landforms
2. Show a card, say the term, and have students repeat the term.
3. Place the cards on the table. Have students point to a card when you ask easy questions.
EXAMPLE Say: *Where is the strawberry?*
4. Ask yes/no questions about the cards. Make silly, obvious mistakes to help students understand.

Extend Add simple descriptors to the terms. Model and repeat the term, the phrase, and complete sentences. Follow with yes/no questions. **EXAMPLE** Say: *Red. Red fruit. This is a red fruit. Is a strawberry red?*

IDEA 2 Making Connections Use cards to make connections between related concepts.
EXAMPLE animals and their habitats, clothing, weather

1. Make a statement that shows how two cards are related. **EXAMPLE** Say: *The (fish) lives in the (water).*
2. Help students find other cards that demonstrate this relationship.

Error Correction Don't overtly correct students. Model the correct construction when you repeat it for students. **EXAMPLE** Student says: *Live fish in water.* You say: *Yes, fish live in the water.*

Kinesthetic Support

Words and Actions Use movement to explain unfamiliar words.

1. Pantomime actions while saying a science related word and displaying the corresponding card. **EXAMPLE** *push, pull, grow*
2. Have students repeat the word and action.

Facial Expressions Help students understand more difficult terms by using exaggerated facial expressions for words like *happy, sad, sweet, sour*, and so on.

Oral Language Practice

Identifying Objects Practice labeling science concepts orally.

1. Place students in two facing lines. Students should work with the person directly across from them.
2. One student picks a card and keeps it hidden.
3. The second student asks yes/no questions to guess the image on the card.
4. Students reverse roles and repeat the activity.

Encouraging Success Pair students with similar ability levels. Pairing students with vastly different ability levels (a native speaker and a beginning learner) can be frustrating for the advanced learner and embarrassing for the beginner.

Sentence Frames

Make Descriptions

The _____ is/are _____.

EXAMPLE

- The ball is big.
- The cherries are sweet.

Extend the Frame

- The ball is very big.
- The ball is not big.

Graphic Organizers

Classifying Visualize two groups.

1. Choose sight word cards that represent opposites or different characteristics.
EXAMPLE *cold/hot, fly/run, yellow/green*
2. Place sight word cards on the top of each side of the T-chart.
3. Direct students to place photo cards in the appropriate columns. **EXAMPLE** *summer, ice, fire, snow, sun*

Early Intermediate Level Activities

Independent Practice

IDEA 1 Sight Words Practice saying sight words to make terms and phrases.

1. Choose photo cards that include words starting with vowels. **EXAMPLE** *airplane, bicycle, car, owl, motorcycle*
2. Pair articles or other words from the sight word cards to create phrases. **EXAMPLE** *an airplane/ a car; her motorcycle/his bicycle*
3. Have students use other sight words and cards to create complete sentences, then read their sentences aloud to the group.

Extend Encourage other students to ask questions about the sentences.

IDEA 2 Using Art Extend word knowledge by drawing a background scene around a photo card.

Materials: Poster board, crayons, colored pencils or markers

1. Place a photo card on poster board.
2. Help students write the term at the top of the poster board.
3. Students then “extend” the photo by drawing the rest of a scene around the card.

EXAMPLE animals in a habitat, school supplies in a classroom

Extend Help students learn new words to use to label other items in their drawings.

Oral Language Practice

IDEA 1 Description Game Increase listening and speaking skills.

1. Have students sit in a circle and pass photo cards around one at a time.
2. The first student gives a two-word description of the photo. He or she can describe color, texture, size, or shape.
3. The next student repeats the description and adds another descriptor.
4. Continue until the last student has repeated all of the descriptions and added his or her own. Allow students to pass if they cannot think of a description.

Positive Reinforcement Be positive, but repeat the descriptions in the correct format at each stage so students continue to model the correct formation.

IDEA 2 Asking Questions Demonstrate science knowledge by answering questions about science topics.

1. Ask simple yes/no questions. **EXAMPLE** Say: *Is this a mountain?*
2. Move to questions with simple answers. **EXAMPLE** Say: *Is a mountain big or small?*
3. Model higher-order questions using the words *who, how, when, where, or what if*. **EXAMPLE** Say: *Where can you see a mountain?*

Extend Students take turns asking their groups questions about their cards. Help them form questions that match their ability levels.

Sentence Frames

Make Comparisons

The _____ is/are _____.

The _____ is/are _____-er.

EXAMPLE

- The cats are fast.
- The horses are faster.

Extend the Frame

- The horses are **faster than** the cats.

Independent Learning Strategies

Asking for Help Students need to learn how to ask for vocabulary help themselves. Students will feel more successful when they can ask for help. Model questions such as:

- What do you call an animal that swims in the water?
- What is the name for this?
- How do you spell that word?

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Intermediate Level Activities

Writing Skills

Summarizing Use the words *keep*, *delete*, and *substitute* to help summarize a science passage.

1. Read a short science passage aloud.
2. Use the photo cards to illustrate what you are reading.
3. Give the cards to a group of students to help them retell what they have heard.
4. Have groups work to decide which cards to keep, which to delete, and which to substitute when writing a summary of the important points.

Building Routines Use hand motions to symbolize each summarizing action (*keep*, *delete*, and *substitute*). Use the hand motion each time you repeat the word to reinforce the action.

Guided Instruction

Predicting Use specific language structures to make predictions.

1. Model a prediction for the class.

EXAMPLE Say: *What would happen if there was no rain? All the plants would die.*

2. Use photo cards that illustrate terms in a prediction. **EXAMPLE** *rain* and *dandelion*, *stop sign* and *truck*, *light switch* and *lamp*, *strawberries* and *mouth*
3. Have students choose sets of cards and make their own predictions.

Extend Have students make predictions they can test on their own. Examples include what will happen if more weights are added to one side of a balance than to the other.

Oral Language Practice

Identifying Characteristics Build vocabulary by describing objects.

1. Select cards that represent a theme.
EXAMPLE appliances, occupations
2. Have each student pick a card that they will represent.
3. Form groups of two to three students. Have students use words such as *who*, *what*, *when*, *where*, and *how* to ask questions about the cards.
4. Each student should prepare two to three sentences that describe something about their cards.

Graphic Organizers

Concept Web Use a concept web to review what students already know.

1. Place the main idea in the center of the web and then have students fill in the supporting details in the surrounding circles.
2. Include icons to help students remember what should be included in each place. Have students draw pictures to visually represent the ideas in each circle.

Independent Practice

Comparing and Contrasting Discuss or write about similarities or differences.

1. Give students a random assortment of photo cards.
2. One student chooses a pair of cards and describes one way they are alike.
3. A second student says one way the pair is different.

Sentence Frames

Make Predictions

If _____ is/are _____, then _____.

EXAMPLE

- If the light is on, then it will get hot.
- If the dogs are mammals, then they will have fur.

Extend the Frame

- **Predict what would happen** if the light is turned on.