SCIENCE FOR LANGUAGE DEVELOPMENT

GRADE 7 • BOOK 1

BASED ON ALASKA SCIENCE STANDARDS

Sealaska Heritage Institute
Integrating culturally responsive place-based content with language skills development for curriculum enrichment

CULTURAL SPECIALISTS
David Katzeek
Linda Belarde
Donald Gregory
Rosita Worl

UNIT DEVELOPMENT
Karen Eddy

PROOFING & PAGE DESIGN
Christy Eriksen

COVER DESIGN
Crystal Worl

COVER ART
Celeste Worl

CURRICULUM ASSISTANT
Michael Obert

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OVER THE YEARS, much has been written about the successes and failures of students in schools. There is no end to the solutions offered, particularly for those students who are struggling with academics. For example, there have been efforts to bring local cultures into the classroom, thus providing the students with familiar points of departure for learning.

While the inclusion of Native concepts, values, and traditions into a curriculum provide a valuable foundation for self-identity and cultural pride, they may not, on their own, fully address improved academic achievement.

Through science lessons, students are exposed to new information and to the key vocabulary that represents that information. While the students may acquire, through various processes, the scientific information, the vocabulary is often left at an exposure level and not internalized by the students. Over time, this leads to language delay that impacts negatively on a student’s ongoing achievement.

Due to weak language bases, many Native Alaskan high school students struggle with texts that are beyond their comprehension levels and writing assignments that call for language they do not have.

This program is designed to meet the academic realities faced by high school students every day, using a developmental process that integrates culture with skills development.

To this end, each key vocabulary word, in science, is viewed as a concept. The words are introduced concretely, using place-based information and contexts. Whenever possible, the concept is viewed through the Native heritage cultural perspectives. Using this approach, the students have the opportunity to acquire new information in manageable chunks, the sum total of which represent the body of information to be learned in the science program.

When the key vocabulary/concepts have been introduced, the students are then taken through a sequence of listening, speaking, reading, and writing activities designed to instill the vocabulary into their long-term memories.

This is the schema for the Developmental Language Process:
Finally, at the end of each unit, the students will participate in enrichment activities based on recognized and research-based best practices. By this time, the science information and vocabulary will be familiar, adding to the students’ feelings of confidence and success. These activities will include place-based and heritage culture perspectives of the information learned.

This approach is radically different from current practices in most science classes. Historically, little or no formal vocabulary development takes place. It is assumed that the vocabulary is being internalized during the learning process, which is most often an erroneous assumption.

Increasing the language bases of the students will lead to improved comprehension in listening and reading, and higher levels of production in creative speaking and writing.

This, coupled with the place-based and culturally-responsive content, will provide the students with the foundations necessary for ongoing confidence and achievement.
KEY VOCABULARY
Key Vocabulary

EVALUATE
to determine the value or worth by careful study

COMMUNICATE
to share information, data, or findings with others through written or spoken words

MEASURE
to find the size, volume, mass, weight, or temperature of an object or how long an event occurs
Key Vocabulary

**GENERALIZE**

to draw a general conclusion from

**CLASSIFY**

to sort into groups according to their properties or patterns

**PREDICT**

to state possible results of an event or experiment based on past experiences or observations
Key Vocabulary

IDENTIFY

to establish the identity of

DESCRIBE

to use words or pictures to show what is observed

OBSERVE

pay attention to behaviors or details and come to a conclusion
Key Vocabulary

INFER

to make conclusions from facts
LESSONS
Let’s Move
Identify an appropriate body movement for each vocabulary word. This may involve movements of hands, arms, legs, etc. Practice the body movements with the students. When the students are able to perform the body movements well, say a vocabulary word. The students should respond with the appropriate body movement. You may wish to say the vocabulary words in a running story. When a vocabulary word is heard, the students should perform the appropriate body movement. Repeat, until the students have responded to each word a number of times.

What’s the Answer?
Before the activity begins, develop questions related to the concept being studied. For each question, prepare three answers—only one of which in each set is correct for the question asked. Ask the students the question and then read the three answers to them. The students should show you (using their fingers or prepared number cards) which answer is correct for the question asked. Repeat this process with other questions and answers.

SPEAKING
Right or Wrong?
Mount the vocabulary pictures on the board. Point to one of the pictures and say its vocabulary word. The students should repeat the vocabulary word for that picture. However, when you point to a picture and say an incorrect vocabulary word for it, the students should remain silent. Repeat this process until the students have responded a number of times to the different vocabulary pictures.

Hand Tag
Group the students in a circle on the floor. Have the students place their hands on the floor, palms down. Stand in the center of the circle with the vocabulary picture and a flashlight. The object of the activity is to attempt to tag a student’s hand or hands with the light of the flashlight. The students must pull their hands from the circle when they think they are about to be tagged. When you eventually tag a student’s hand or hands, he/she must then say a complete sentence using the word for a vocabulary picture that you show. Repeat this process until many students have responded.
**READING**

*Introduce the science sight words to the students—match the sight words with the vocabulary pictures. The sight words are included in the Student Support Materials, attached to these lesson plans.*

**Sight Word Bingo**

Before the activity begins, prepare a page that contains the sight words. Provide each student with a copy of the page. The students should cut out the sight words. When the students have cut out their sight words, each student should lay all of the sight words, but one, face down on his/her desk. Show a vocabulary picture. Any student or students who have the sight word for that picture face-up on their desks should show the sight word to you. Then, those sight words should be placed to the side and other sight words turned over in their place. Continue in this way until a student or students have no sight words left on their desks.

**Letter Encode**

Give each student five copies of a page that contains the letters of the alphabet. The students should cut all of the letters out. Mount one of the science pictures on the board. The students must use the cut out letters to spell the word. Review the students’ work. Repeat, until all of the words have been spelled in this way. The students should keep their letters in individual envelopes for use in other units.

**Student Support Materials**

Have the students work on the activity pages from the Student Support Materials for this Unit.

**WRITING**

**Watch Your Half**

Prepare a photocopy of each of the vocabulary pictures. Cut the photocopied pictures in half. Keep the picture halves in separate piles. Group the students into two teams. Give all of the picture halves from one pile to the players in Team One. Give the picture halves from the other pile to the players in Team Two. Say a vocabulary word. When you say “Go,” the student from each team who has the picture half for the vocabulary word you said should rush to the board and write the word on the board. The first player to do this correctly wins the round. Repeat until all players have participated. This activity may be played more than once by collecting, mixing, and redistributing the picture halves to the two teams.
Sentence Completion
Write a number of sentence halves on individual sentence strips. These should include both the beginning and ending halves of sentences. Mount the sentence halves on the board and number each one. Provide the students with writing paper and pencils/pens. Each student should then complete ONE of the sentence halves in his/her own words, writing his/her part of the sentence on the sheet of paper. When the students have completed their sentence halves, have a student read ONLY the sentence half he/she wrote. The other students must then attempt to identify the “other half” of the sentence on the board (by its number). Repeat until all of the students have shared their sentence halves in this way.

Student Support Materials
Have the students work on the activity pages from the Student Support Materials for this Unit.
VOCABULARY
PICTURES
PREDICT
OBSERVE
DESCRIBE
MEASURE
GENERALIZE
INFER
COMMUNICATE
EVALUATE
IDENTIFY
STUDENT SUPPORT MATERIALS

Listening  •  Mini Pictures
Listening: Mini Pictures

Have the students cut out the pictures. Say the key math words from this unit, and the students should hold up the pictures for them.
STUDENT SUPPORT MATERIALS

Listening Comprehension
Listening Comprehension

Read the following sentences to the students. The students should circle “true” or “false” for each of the sentences. Review the students’ work.

1. To evaluate is to determine the value or worth of something by careful study. True False
2. Communicate is to share information, data, or findings with others through written or spoken words. True False
3. Measure is to find the size, volume, mass, weight, or temperature of an object. True False
4. Generalize is to sort into groups according to their properties. True False
5. Classify is to use words or pictures to show what is observed. True False
6. Predict is to state possible results of an event or experiment based on past experiences or observations. True False
7. Identify is to establish the identity of. True False
8. Describe is to pay attention to behaviors or details and come to a conclusion. True False
9. Observe is to draw a general conclusion from. True False
10. Infer is to make conclusions from facts. True False
STUDENT SUPPORT MATERIALS

Sight Words
generalize
classify
predict
infer
STUDENT SUPPORT MATERIALS

Basic Reading ● Sight Recognition
Sight Words Activity Page

Have the students highlight or circle the words in this word find. Words appear horizontally.

classify  communicate  describe  evaluate
generalize  identify  infer
measure  observe  predict

classify  communicate  describe  evaluate
generalize  identify  infer
measure  observe  predict
## Sight Words Activity Page

Have the students highlight or circle the words in this word find. Words appear horizontally.

<table>
<thead>
<tr>
<th>classify</th>
<th>communicate</th>
<th>describe</th>
<th>evaluate</th>
<th>generalize</th>
<th>identify</th>
<th>infer</th>
<th>measure</th>
<th>observe</th>
<th>predict</th>
</tr>
</thead>
</table>

- **Generalize**
- **Communicate**
- **Describe**
- **Evaluate**
- **Classify**
- **Identify**
- **Infer**
- **Measure**
- **Observe**
- **Predict**
Sight Words Activity Page

Have the students cut out the key words and glue them at the bottom of their pictures.
Have the students print the key words from this unit horizontally in the boxes (each word may be written more than once). They should then fill in all other boxes with any letters. Have the students exchange pages. The students should then circle the words on the page.
STUDENT SUPPORT MATERIALS

Basic Reading  •  Encoding
Encoding Activity Page

Have the students cut out and encode the syllables of the words, OR number the syllables in their correct sequence.

- ti - i - den - fy
- sure - mea
- pre - dict
Encoding Activity Page

Have the students cut out and encode the syllables of the words, OR number the syllables in their correct sequence.

ate || e || val || u

________  ________  ________  ________

ob || serve

________  ________

fer || in

________  ________
Word Scramble Activity Page

Rearrange or unscramble the following letters to form one of the listed unit words. As you use a word, cross it off.

<table>
<thead>
<tr>
<th>classify</th>
<th>describe</th>
<th>predict</th>
<th>measure</th>
<th>communicate</th>
<th>infer</th>
<th>evaluate</th>
<th>identify</th>
<th>generalize</th>
</tr>
</thead>
</table>

- r t p d e c i
- r b v o s e e
- d e s b c i r e
- s m r a u e e
- a l s f c i s y
- e e n r g z e l i a
- e n f i r
- u i c m e t a m n c o
- n e d y i t f i
- l v a u e e t a

classify, predict, communicate, infer, identify, describe, measure, observe, evaluate, generalize
STUDENT SUPPORT MATERIALS

Reading Comprehension
### Reading Comprehension Activity Page

*Have the students cut out the words and glue them under their definitions.*

<table>
<thead>
<tr>
<th>Action</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>to determine the value or worth by careful study</td>
<td>to determine the value or worth by careful study</td>
</tr>
<tr>
<td>to draw a general conclusion from</td>
<td>to sort into groups according to their properties or patterns</td>
</tr>
<tr>
<td>to establish the identity of</td>
<td>to use words or pictures to show what is observed</td>
</tr>
<tr>
<td>to make conclusions from facts</td>
<td></td>
</tr>
</tbody>
</table>

**Words to Cut Out:**
- communicate
- observe
- describe
- classify
- predict
- generalize

**Sealaska Heritage Institute**
Reading Comprehension Activity Page

Write the word or words that best complete each sentence in the space below. Words may be used only once.

<table>
<thead>
<tr>
<th>classify</th>
<th>predict</th>
<th>communicate</th>
<th>infer</th>
<th>identify</th>
<th>describe</th>
<th>measure</th>
<th>observe</th>
<th>evaluate</th>
<th>generalize</th>
</tr>
</thead>
</table>

1. Students take yearly assessments to ____________ their skills in reading, writing, and math.
2. Were the tourists able to ____________ the humpback whale breaching off the starboard of the ferry.
3. The students in Life Science will learn how scientists ____________ animals.
4. My mother, the “local weather reporter” ____________ rain for the week end.
5. She tends to ____________, instead of stating the specifics.
6. It will be difficult to ____________ how the new dress code will effect student attitude.
7. We ____________ a lot of information through our body language.
8. The ounce is a ____________ of weight.
9. The police officer asked the witness to ____________ the robber.
10. Many young readers can ____________ with the main character of the story.
STUDENT SUPPORT MATERIALS

Basic Writing
Basic Writing Activity Page

Have the students write the word for each picture.
Basic Writing Activity Page

Have the students write in the missing letters.

cla__________________y
co___________________icate
de___________________be
e___________________uate
gel__________________alize
iden__________________y
in___________________
m___________________ure
obs__________________e
p____________________ict
Graphic Organizer

Model the process for students using the following unit words.

<table>
<thead>
<tr>
<th>WHAT IT IS:</th>
<th>WHAT IT IS NOT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>classify</td>
<td></td>
</tr>
<tr>
<td>communicate</td>
<td></td>
</tr>
<tr>
<td>describe</td>
<td></td>
</tr>
<tr>
<td>evaluate</td>
<td></td>
</tr>
<tr>
<td>generalize</td>
<td></td>
</tr>
</tbody>
</table>
## Graphic Organizer

<table>
<thead>
<tr>
<th>WHAT IT IS:</th>
<th>WHAT IT IS NOT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>identify</td>
<td></td>
</tr>
</tbody>
</table>

### EXAMPLES: infer

### NOT EXAMPLES: measure

### EXAMPLES: observe

### NOT EXAMPLES: predict
STUDENT SUPPORT MATERIALS

Creative Writing
Have the students write sentences of their own, using the key words from this unit. When the students’ sentences are finished, have them take turns reading their sentences orally. The students should say “Blank” for the key words; the other students must name the “missing” words. You may wish to have the students write the “definitions” for the key words.

CLASSIFY

COMMUNICATE

DESCRIBE

EVALUATE

GENERALIZE

INFER

IDENTIFY

MEASURE

OBSERVE

PREDICT
On the lines below, write a paragraph based on the picture. Before you begin writing, reflect on the unit words – describe, generalize, infer, observe, and predict.
UNIT ASSESSMENT

A–1: Science as Inquiry Process
Unit Assessment Teacher’s Notes
Grade 7 • Unit 1 (A–1)
Theme: Science as Inquiry Process

Date:____________________
Unit Assessment

Provide each student with a copy of the students’ pages. Read the following instructions aloud. The students should answer the questions on their copies of the assessment.

BASIC LISTENING
Turn to pages 1 in your test. Look at the pictures in the boxes.

1. Write the number 1 on top of the picture for PREDICT.
2. Write the number 2 on top of the picture for OBSERVE.
3. Write the number 3 on top of the picture for DESCRIBE.
4. Write the number 4 on top of the picture for CLASSIFY.
5. Write the number 5 on top of the picture for GENERALIZE.
6. Write the number 6 on top of the picture for INFER.
7. Write the number 7 on top of the picture for COMMUNICATE.
8. Write the number 8 on top of the picture for EVALUATE.
9. Write the number 7 on top of the picture for IDENTIFY.
10. Write the number 8 on top of the picture for MEASURE.

LISTENING COMPREHENSION
Turn to page 2 in your test. Listen to the sentences I say. Circle “T” for true and “F” for false sentences.

1. To evaluate is to determine the value or worth of something by careful study.
2. Communicate is to share information, data, or findings with others through written or spoken words.
3. Measure is to find the size, volume, mass, weight, or temperature of an object.
4. Generalize is to sort into groups according to their properties.
5. Classify is to use words or pictures to show what is observed.
6. Predict is to state possible results of an event or experiment based on past experiences or observations.
Unit Assessment

7. Identify is to establish the identity of.
8. Describe is to pay attention to behaviors or details and come to a conclusion.
9. Observe is to draw a general conclusion from.
10. Infer is to make conclusions from facts.

SIGHT RECOGNITION
Turn to pages 3 and 4 in your test. Look at the pictures in the boxes. Circle the word for each picture.

DECODING/ENCODING
Turn to page 5 in your test. Look at the scrambled letters on the left. Rearrange or unscramble the letters to form each of the unit words.

READING COMPREHENSION
Turn to page 6 in your test. Write the word or words that best complete each sentence in the space below. Words may be used only once.

BASIC WRITING
Turn to page 7 in your test. Look at the pictures in the boxes. Write the word for each picture.

CREATIVE WRITING
Turn to page 8 in your test. Write a sentence of your own, using each word.
Teacher: To get a percentage for this student’s assessment, divide the total number of questions correct by the total number of questions, then multiply this answer by 100 to determine the percentage of questions answered correctly.
SCIENCE PROGRAM

Unit Assessment Student Pages
Grade 7  •  Unit 1 (A–1)
Theme: Science as Inquiry Process

Date:___________      Student’s Name:____________________

Number Correct:__________       Percent Correct:__________
<table>
<thead>
<tr>
<th></th>
<th>T</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>3.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>4.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>5.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>6.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>7.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>8.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>9.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
classify
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observe
predict
rtpdeci  e__c__
rbvosee  b_e____
desbcire  e________e
smrauee  m___s_____ 
alssfcsisy  l_s_______
eenrgzelia  ______alz__
enfir  __________e__
uicmetamnco  o____ni______
nedyitfi  e__t______
lvaueeta  e__a_________
Students take yearly assessments to ____________ their skills in reading, writing, and math.

Were the tourists able to ____________ the humpback whale breaching off the starboard of the ferry.

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My mother, the “local weather reporter” ____________ rain for the weekend.

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It will be difficult to ____________ how the new dress code will effect student attitude.

We ____________ a lot of information through our body language.

The ounce is a ____________ of weight.

The police officer asked the witness to ____________ the robber.

Many young readers can ____________ with the main character of the story.