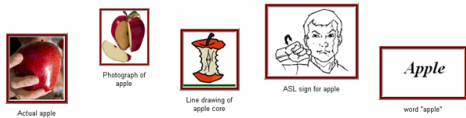


Concrete to Abstract

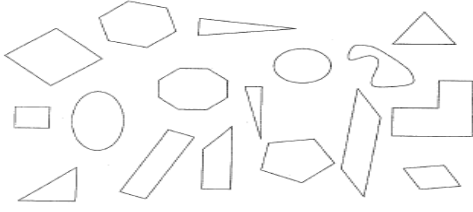


Actual apple Photograph of apple Line drawing of apple core ASL sign for apple *Apple* word "apple"

Concrete ▶▶▶ **Abstract**

<http://www.usdb.org/deafblind/db/CIT%20Web%20Lessons/experiencebookGP/experiencebookGP2.html>

Geometric Attributes



Carroll, M., Coates, G., Coggins, D., & Kravin, K. (2007). *English Language Learners in the Mathematics Classroom*. Corwin Publishing

Sentence Starters


- "I noticed that ... "
- "I agree with *(name)* that there are ... "
- "I'd like to build on *(name)*'s idea ... "
- "I don't understand what *(name)* meant when she said ... "

Academic Language Word Bank

- Parallelogram
- Isosceles triangle
- Hexagon
- Trapezoid
- Polygon
- Rhombus
- Regular octagon

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What do scientists talk about?



<http://www.yourthoughtpartner.com/blog/7tag-communication%20skills>


Use Scientific Conversations to:

- Discuss data and results
- Describe observations
- Provide reasons
- Make arguments and develop positions
- Provide evidence and challenge others
- Tell stories

Benefits of Effective Science Conversations

- Assist in improving ability to build scientific arguments and reason logically
- Talking about their thinking helps them reflect, participate in and build on scientific thinking
- Bring to light discrepancies in their thinking
- Provide motivation by giving them a change to offer their voice, claims and position on issues

MAINE Let's try it



What do you know about rocks?

- 3-5 people in a circle facing out
- Same amount facing each person on the outside
- Will have one minute to speak on the topic

MAINE Additional Activities

1. Have students read and discuss instance where different definitions of a word are used
2. Discuss how they understand the word
3. Compare and contrast the scientific use of the word to common or multiple meanings of the words

MAINE Vary Types of Oral Interaction

- **Conversation** with a partner, small group, whole group
- **Role plays** should create a situation that needs resolution
- **Hearings** have an "expect" group that discuss a topical question and may be interviewed by fellow students who have to make the final decision
- Use **unusual images** to start conversation
- **Forced Contribution**, such as numbered heads, which ensure that all group members give their opinion or contribute
- **Guided conversations** allows students to use a narrative
- **Recreating the narration** with picture supports while pushing student to produce more oral language
- **Small Talk/Party Talk** has students walking around talking to each other about a specific topic

MAINE Information Gap

Task Based Activities


- Missing information: asking and answering questions
- Incomplete crossword: describing, defining and guessing
- Spot the difference: description and comprehension
- Use images to complete the story or lyrics prior to listening and confirming
- Finding places on a map

Conversation based on Images

- Student 1: Comes to the front of the class and views the image. Returns to their partner and describes the image.
- Student 2: Listens to student 1 and draws the image described.

MAINE Ted Talk: Talk Nerdy to Me

- [Melissa Marshall: Talk nerdy to me](#)



MAINE Sources

Caroll, M., Coates, G., Coggins, D., & Kravin, K. (2007). *English Language Learners in the Mathematics Classroom*. Corwin Publishing

Freeman, D. and Anderson, M. (2011) *Techniques & Principles in Language Teaching, 3rd ed.* Oxford: Oxford University Press.

Levine, L.N., Smallwood, B.A., & Haynes, E.F. (2012). *Math and science: Skills and strategies to adapt instruction for English language learners*. Hot Topics in ELL Education (B.A. Smallwood, Series Ed.). Washington, DC: Center for Applied Linguistics.

Michaels, S. Shouse, A.W., and Schweingruber, H.A. (2008) *Ready, Set, Science! Putting research to work in K-8 Science Classrooms*. Washington, D.C.: National Academies Press.

Science Conversation Starter in Concentric Circles

Focus: What can you tell me about rocks?

Word Bank

Rocks	metamorphic
Minerals	igneous
Hardness	sedimentary
Color	composition
Luster	properties
Cleavage	physical processes
Streak	

(All rocks are made from minerals.)



OUTSIDE SPEAKER

Conversation/discussion sentence stems

What can you tell me about...?

Can you explain the process of ...?

What was your procedure for...?

Tell me more about that...

What do you mean by...?

What else did you observe ...?
(observation)

How do you know?
(observation/evidence)

Why is that important?
(argument/position/reasoning)

What does that remind you of?
(Storytelling)

INSIDE SPEAKER

Response/conversation starters

For this experimental procedure
I/we...

I observed

My data shows/suggests ...

I/we found evidence ...

I argue that...

My position is ...

I feel knowing _____ is important
because....

It is important to understand _____
because....