



Learning to Develop Effective K-12 Outreach

Kirsten R. Butcher, Ph.D.
Educational Psychology
Instructional Design & Ed Tech Program

Want a Copy of the Slides? Help Yourself!



<http://bit.ly/2oaV0ts>

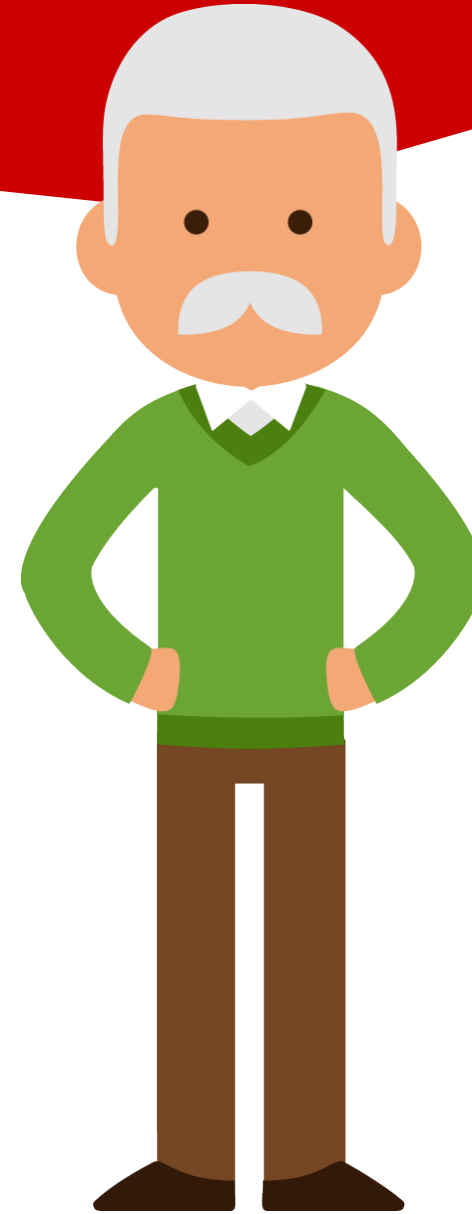
So, you want to do K-12 Outreach...



You bet! It's
gonna be
great!

What Does Outreach Mean to You?

- Who is the audience?
- What should you do?
- What is the outcome?

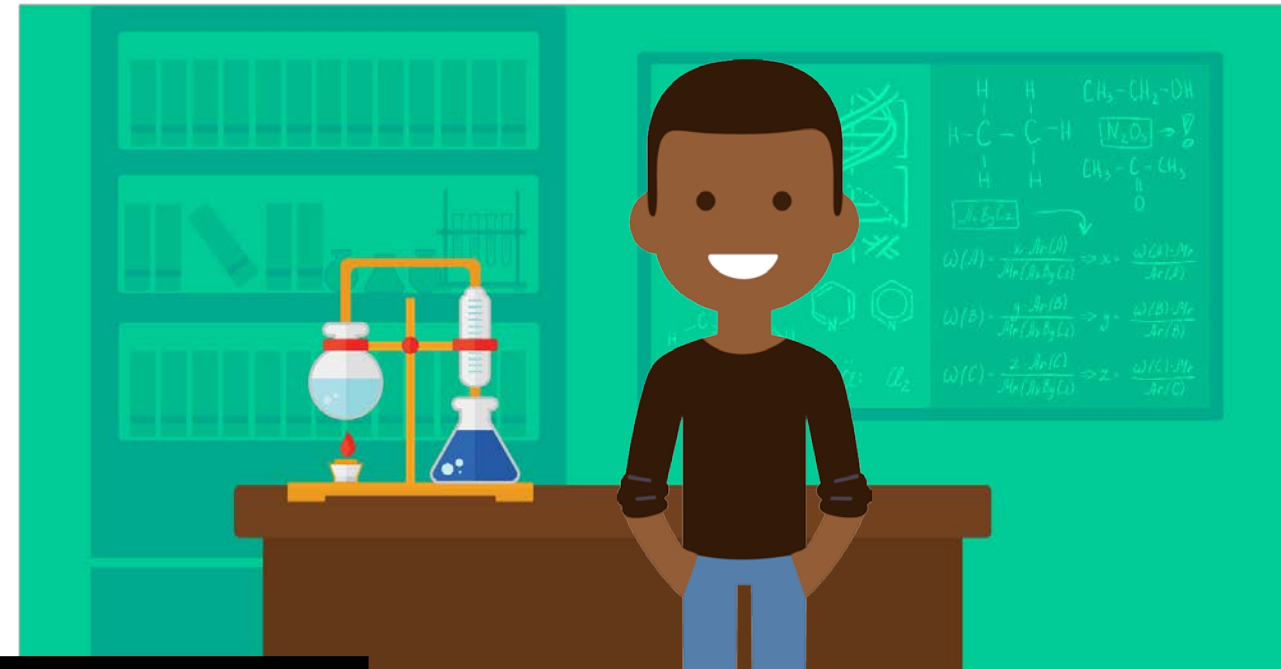


- Kids!
- Hands-on experiments! Cool demos!
- Neat facts! Make it fun!
- They will get excited about _____ (insert your topic) !
- They will learn about _____ (insert your topic) !



Learning ... Not a Simple Goal

- How can you tell if someone has learned?
- How long will learning last? How do you know?
- What are the best ways to help kids learn an idea or concept?



Jot down your answers to these questions.

Quick Example: Levels of Learning

Pull out any digital device with network access and a web browser.
(Laptop OK too.)



Speed Lesson: 4th Grade Utah Core



First peoples of Utah: **Utes**

- By 1500, Utes had spread through eastern and central Utah
 - Also parts of CO, WY, and NM
- Two distinct groups of Utes in Utah
 - Northern Utes
 - White Mesa Utes

Northern Utes: Central UT to Western CO

- Lived in small family groups. After they got horses, the groups became larger bands.
- Had leaders, but not what we call “chiefs.” Some were spiritual leaders, some helped direct specific activities, and some just offered suggestions.
- Traveled through larger regions hunting, fishing, and gathering plants throughout the seasons.
- Gathered cactus, seeds, and roots to store for winter in buried baskets. Also hunted and dried meat for winter.
- Lived in brush shelters or tipis.
- Wore clothes made from shredded bark or animal hides, used rabbit-fur robes in winter.
- Acquired horses, which let them travel more widely. They could go to the Great Plains to hunt buffalo. Some also became skilled at stealing horses from California and elsewhere.
- Knew the mountains well, used them for refuge.



White Mesa Utes: Four Corners Area

- Were related to Ute groups in Colorado and New Mexico.
- Lived in close association with Paiute bands in the Four Corners area.
- Lived in bands of 1-10 families.
- Migrated through the seasons to harvest plants and animals.
- Spent winters at low elevations and summers at high elevations.
- Hunted deer to use for food, leather, and tools.
- Also hunted desert bighorn sheep, wild turkeys, badgers, beaver, rabbits, fish, and more.
- Lived in tepees made from elk or deer hides in the winter.
- Lived in wikiups in the summer.
- Sometimes grew small gardens near springs.
- Ate plants such as yucca fruit, ricegrass, pinenuts, chokecherries, and wild onions.





Quiz time! Let's Play!

1. Open a web browser on your device.

2. Go to: kahoot.it

2. Type in the code given by presenter.

We'll do two different quizzes, one at a time

3. Enter your nickname

This will be displayed to everyone – please keep this in mind.

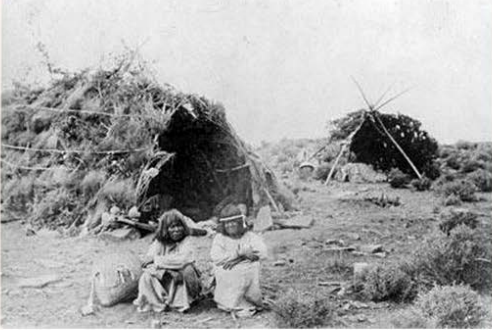
4. Get ready!!



How Did You Decide on Your Answers?

Quiz 1

Q2 In the summer, White Mesa Ute families lived in homes made of poles covered in brush called:



11


Next >

0 Answers

<input checked="" type="radio"/> Longhouses	<input type="radio"/> Tepees (Tipis)
<input type="radio"/> Wattle houses	<input type="radio"/> Wikiups

Quiz 2

Q2 Group size of Northern Ute bands grew with the introduction of horses, likely because...



77

Next >

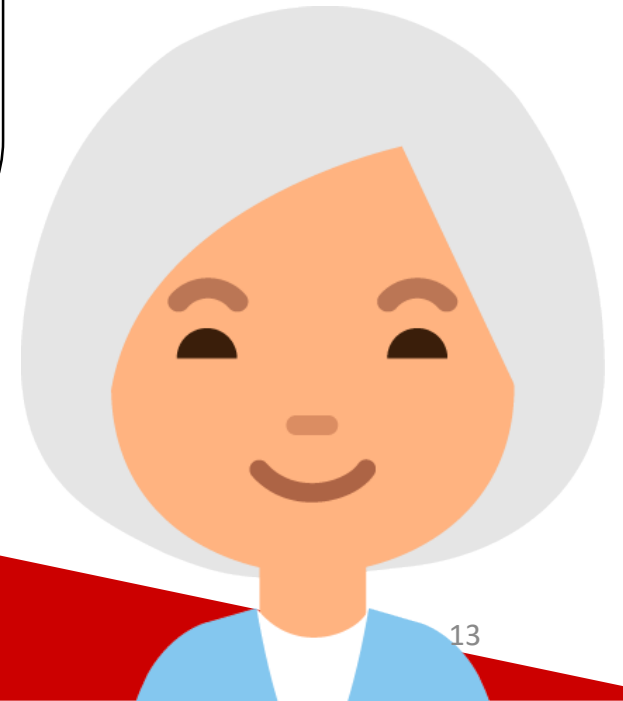
0 Answers

<input checked="" type="radio"/> Horses made it easier to hunt and gather resources	<input type="radio"/> Horses were valuable and could be traded for supplies
<input type="radio"/> Horses needed more people to care for them	<input type="radio"/> Larger groups were needed to guard the horses against theft

Key Points

Learning is **not** a unitary concept.

Learning occurs at **different levels**.



Memory vs. Understanding

Kintsch, 1998

Theory of comprehension: Construction-Integration Theory

Surface Level = Exact Representation

Textbase = Key ideas from materials

Situation Model = Deep understanding



Memory vs. Understanding

Kintsch, 1998

Theory of comprehension: Construction-Integration Theory

Surface Level = Exact Representation

Can recall or reproduce. Understanding isn't necessary.

Mersidotes and dosidotes

And little lamsey divey

Diddley-divey do

Wouldn't you?

Example adapted from Kintsch (1998)



Rote Learning ≠ Understanding

Mersidotes and dosidotes

And little lamsey divey

Diddley-divey do

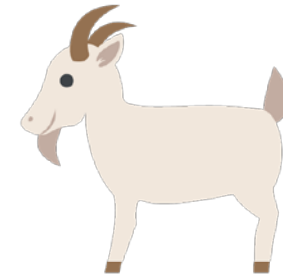
Wouldn't you?

Mares eat oats and does eat oats

And little lambs eat ivy

A kid'll eat ivy too

Wouldn't you?



Memory vs. Understanding

Kintsch, 1998

Theory of comprehension: Construction-Integration Theory

Surface Level = Exact Representation

Textbase = Key ideas from materials

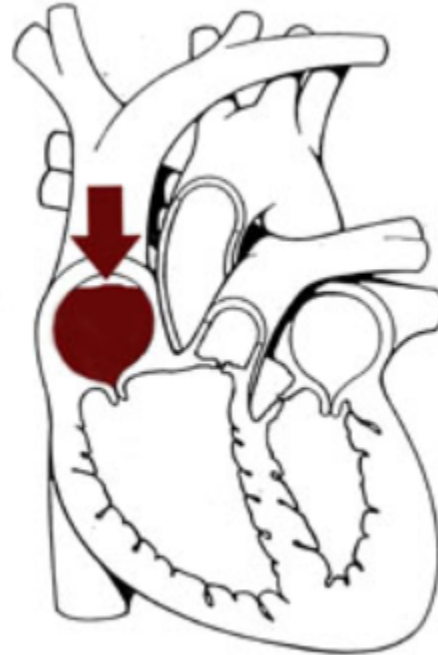
- Formed by **encoding** content from learning materials
- Fails to go beyond the learning materials, fades quickly
- Tested by assessments targeting **recall** or **recognition**
 - Multiple choice, fill-in-the-blank, True/False, etc.
 - Exhibited as **memory** of the learning materials

Situation Model = Deep understanding



Textbase Questions

As the blood flows through the capillaries in the body, carrying its supply of oxygen, it also collects carbon dioxide. The blood that empties into the right atrium is dark colored. It has picked up carbon dioxide from the body cells. It has left most of its oxygen with the cells.



- What does the blood collect as it flows through the capillaries of the body?
- What color is the blood that empties into the right atrium?

Memory vs. Understanding

Kintsch, 1998

Theory of comprehension: Construction-Integration Theory

Surface Level = Exact Representation

Textbase = Key ideas from materials

Situation Model = Deep understanding



Memory vs. Understanding

Kintsch, 1998

Theory of comprehension: Construction-Integration Theory

Surface Level = Exact Representation

Textbase = Key ideas from materials

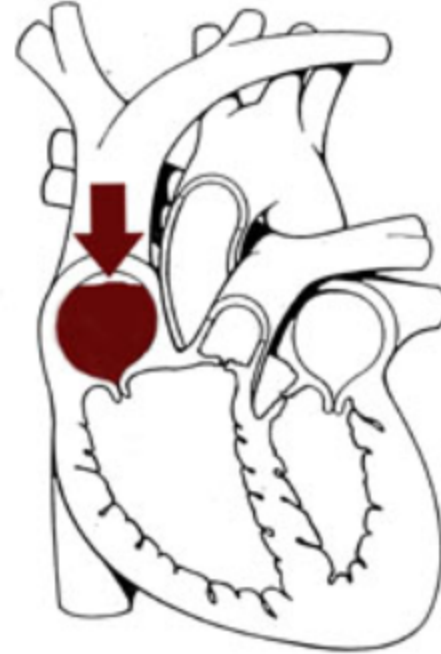
Situation Model = Deep understanding

- Formed by **integration** of current & prior knowledge
- Tested by assessments targeting **high-level** cognition
 - **Inference, application, comparison, analysis**
 - Exhibited as **understanding** of learning materials
- Flexible, robust, and long-lasting representation = transfer



Situation Model Questions

As the blood flows through the capillaries in the body, carrying its supply of oxygen, it also collects carbon dioxide. The blood that empties into the right atrium is dark colored. It has picked up carbon dioxide from the body cells. It has left most of its oxygen with the cells.



- What color would the blood in the right atrium be if, for some reason, it failed to pick up carbon dioxide or to distribute oxygen in the body?
- What might be the difference between blood in the right and left sides of the heart?

Why Deep Learning?

Following a single learning session, how much is retained after 4 days???

Kintsch et al., 1990

Surface Level

~ 0%

Textbase Level

50%

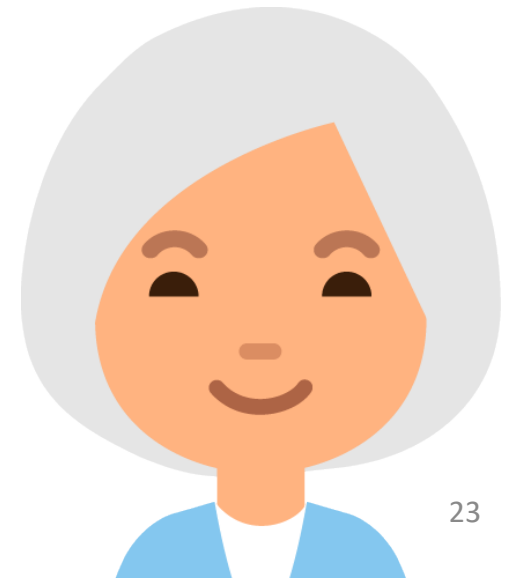
Situation Model

100%

What to Remember about Depth of Learning

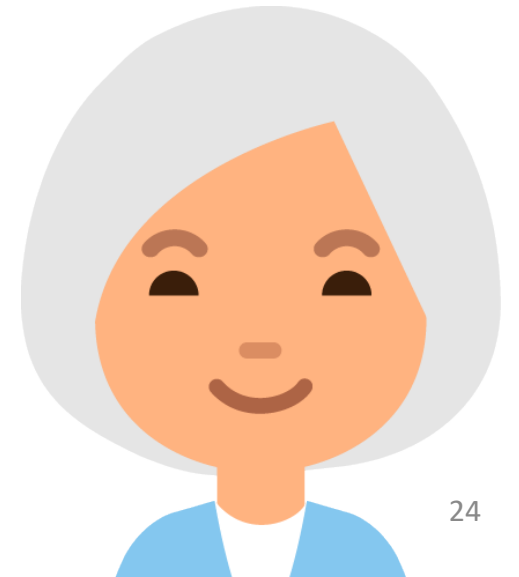
Remembering what has been
shown/told = shallow, short term
learning

Reasoning about information,
generating explanations, making
inferences = deep, long term learning



When to Use Memory (Rote) Questions

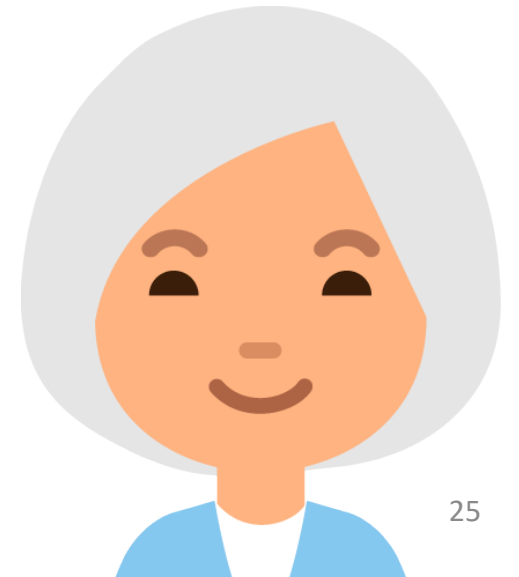
- Ensure learners encode foundational content
- Trigger background knowledge for application
- Throw the kids a few “easy” questions to build up success
- Facilitate long-term retention through spaced recall



Implications for Outreach

Engagement is necessary, but **not** sufficient for learning.

Hands-on activity does **not** ensure deep cognitive processing.



Implications for Outreach

Technology is fun! You can use it to engage students – but depth of learning is determined by you!



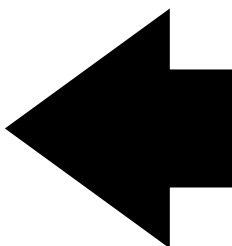
Free to create interactive, quiz game activities
Fun way to get students excited and active
Deep questions ensure depth of learning
Device agnostic (iPads, Chrombooks, Laptops)

Create a free account and create quizzes here:

<https://getkahoot.com/>

Learning Processes for Deep Learning

- Analysis
- Application
- Problem Solving
- Making inferences
- Explaining reasoning
- Comparison & Contrast



What activities **require** students to engage in one or more of these deep processes?

Structuring Your Outreach Session

- Who you are, what you do
- Student role in the session

The core of your session

- Set up a key question or goal
- Lead activities for deep learning
- Scaffold and assess thinking/reasoning
- Help students reflect on learning
- Leave class with extension Qs or activities

Who Are You?



Hi, I'm Brad. I'm a grad student in Chemistry at the University of Utah. I'm here today to teach you about ...



???



Just a different teacher with another lesson.

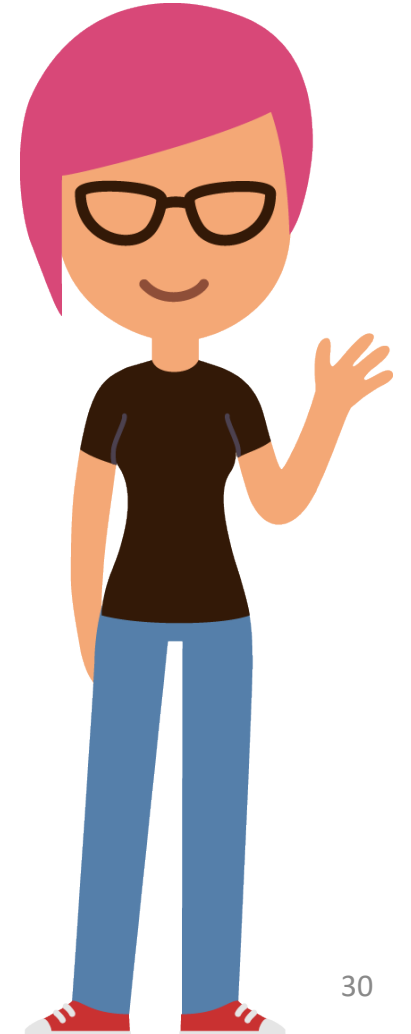
Who Are You? An Outreach Introduction

- **Your name** (the way you want them to address you ... ask about norms)
- The **exciting thing you study at the University of Utah**
 - You're telling a kid, or your grandma!
- **Why that exciting thing is important** to the world
- **What you love about your work**

Jot down your answers to these questions.

Share them with your table.

5 minutes



What is Student Role?

- Related to the field
- Authentic, but reasonable for level
 - Research assistant or scientist-in-training
 - Not expert scientist, not famous geologist
- Contextualizes their activities
- Brings meaning to the activity. Not “just another lesson”



Why am I doing this? I don't know what to do.

How to Prep: 8 Steps to a Great Outreach Session

1. Select skill or concept
2. Find a real question or goal
3. Figure out process
4. Customize for audience
5. Choose activities & scaffolds
6. Monitoring & assessment
7. Create a meaningful ending
8. Post-session reflection



Can we break
this down?
Seems
overwhelming!

Step 1: Identify Target Skill, Idea, or Concept

- What is interesting or exciting in your field?
- What can be investigated or demonstrated with little time or equipment?
- What are core skills or concepts for that grade level?

If you already have a specific topic or goal, think about how it translates to your specific audience. You may need to simplify and make more concrete.



Grade Level Standards

Explore standards for target grade in your area. Connect to your skills and knowledge.

<http://www.uen.org/core/>

K-12 teachers can more easily give you time if you are helping them meet a standard in their classrooms.

The screenshot shows the Utah Education Network (UEN) website. The header includes the UEN logo and the text "UTAH EDUCATION NETWORK". Below the header is a navigation menu with links for PreK-12 EDUCATION, HIGHER EDUCATION, GENERAL LEARNER, PROFESSIONAL DEVELOPMENT, UEN-TV, DISTANCE EDUCATION, NETWORK, and ABOUT UEN. A search bar is located in the top right corner. The main content area is titled "Utah Core Standards" and includes a brief instruction: "Click on a grade level to view the Utah Core standards for that grade. Click on the subject title to view all grades for that subject. Use the UEN Curriculum Search to search the core and to find lesson plans." Below this instruction are three main categories: K-12 Standards, Career and Technical Education Standards, and Adult Education College and Career Readiness Standards. The "K-12 Standards" section is expanded, showing a grid of subject tiles. Each tile includes an icon, the subject name, and a list of available grade levels. The subjects and their grade levels are: Early Childhood (Pre-K), Educational Technology (3-5, 6-8, 9-12), English Language Arts (K, 1, 2, 3, 4, 5, 6, 7, 8, 9-10, 11-12), Financial Literacy (11-12), Fine Arts (K, 1, 2, 3, 4, 5, 6, 7-12), Health Education (3, 4, 5, 6, 7-8, 9-12), K-2 Integrated Core (K, 1, 2), Library Media (K-5, 6-12), Mathematics (K, 1, 2, 3, 4, 5, 6-12), Physical Education (K, 1, 2, 3, 4, 5, 6, 6-12), Science (K, 1, 2, 3, 4, 5, 6, 7, 8, 9-12), Social Studies (Indian Education: K, 1, 2, 3, 4, 5, 6, 7, 8, 9-12), and World Languages (K-12). The page number "34" is visible in the bottom right corner.

Grade Level Standards

Explore standards for target grade in your area. Connect to your skills and knowledge.

<http://www.uen.org/core/>

The screenshot shows the Utah Education Network (UEN) website. The header includes the UEN logo and navigation links for PreK-12 Education, Higher Education, General Learner, Professional Development, UEN-TV, Distance Education, Network, and About UEN. The main content area is titled "Utah Core Standards" and provides instructions on how to navigate the site. Below this, there are several subject area cards, each with a list of grade levels:

- Early Childhood** (Pre-K)
- Educational Technology** (3-5, 6-8, 9-12)
- English Language Arts** (K, 1, 2, 3, 4, 5, 6, 7, 8, 9-10, 11-12)
- Financial Literacy** (11-12)
- Fine Arts** (K, 1, 2, 3, 4, 5, 6, 7-12)
- Health Education** (3, 4, 5, 6, 7-8, 9-12)

Select a grade level. Explore standards relevant to your area and jot down a possible topic related to your work. (Likely more specific than the standard ... that's OK!).

You may want to target skills that are prerequisite to knowledge (e.g., making observations)

10 minutes

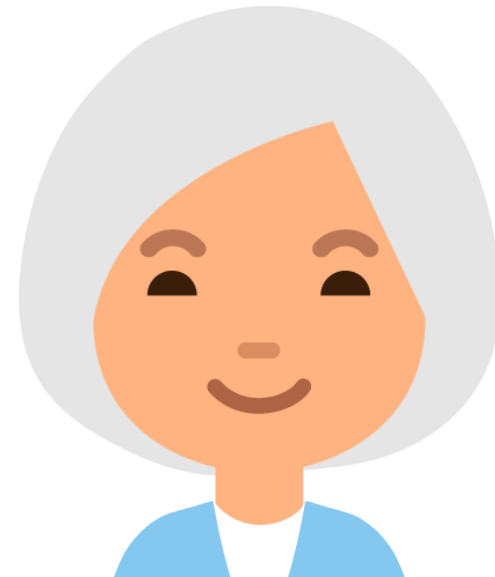
Step 2: Find a REAL Question or Goal

- Now that you have a topic, how will you engage students?
- Students need a **guiding question or goal**
- Works best if it is a **real question** that someone in your area actually would address



Step 3: Figure out the Process / Reasoning

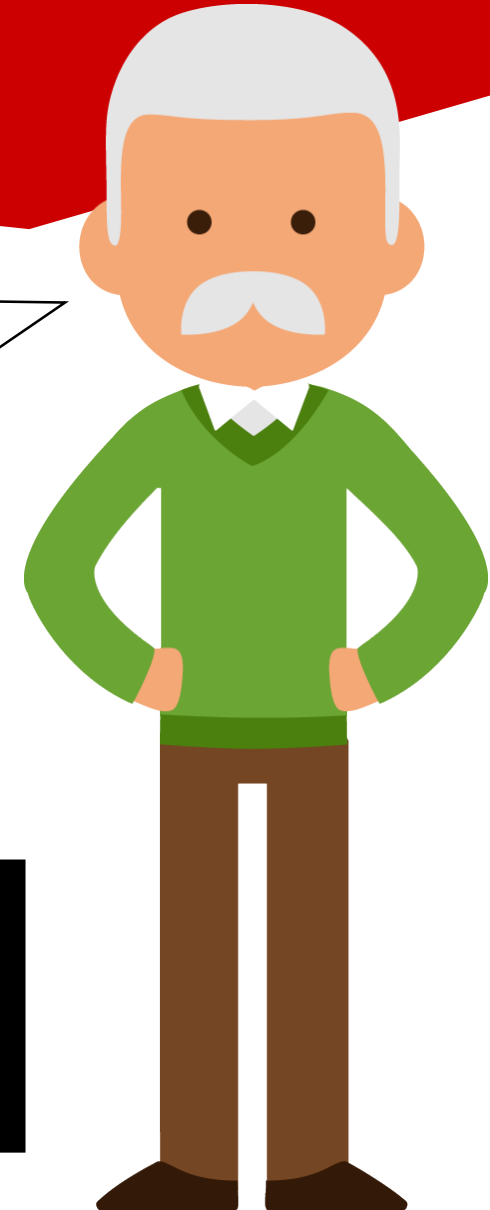
- How would YOU answer that question?
- Think out loud for someone not in your field
- **Break down your thinking into concrete steps**
- At every step, ask yourself: **How do I know that?**



The Expert Blind Spot

What do you mean, how do I know? It's obvious. There's no way they can miss it.

Hint: Examine your work flow. How do you collect data? How do you document findings? How do you decide between ideas?



Begin to flesh out your outreach session:

1. What is a real question or goal relevant to your target concept or skill? (Make it concrete.)
2. How would you figure out the answer to that question or solve the problem?
3. Write down the process you would use (adjust to your target grade)?

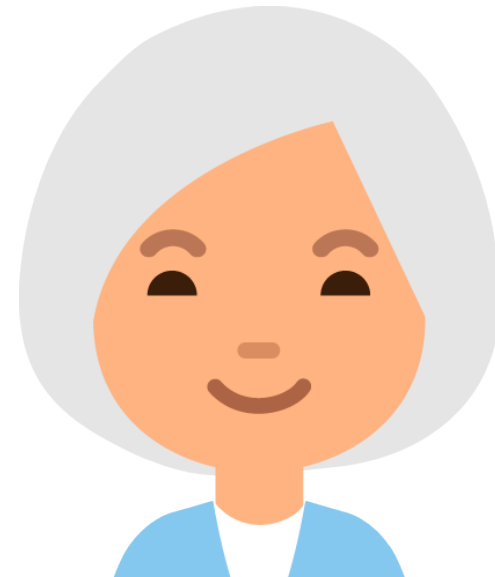
10 minutes



Modeling Your Thinking for Students

- Demonstrate how you figured out the answer.
- Break it down. Be simple and straightforward. Connect to their ideas.
- Think about what student is likely to know to get started
- Invite students to compare their thinking to yours

Modeling your thinking focuses students on the **process of learning**, not just getting the right answer



Practice Modeling Your Thinking

1. Find another workshop attendee who is not in your area of specialization.
2. Tell them your question/goal.
3. Model how to answer one aspect of that question (make it simple). This may be how to analyze a piece of evidence, to solve a problem related to the question, etc. (Partner: Be a helpful critic.)

15 minutes



Step 4: Customizing for your Audience

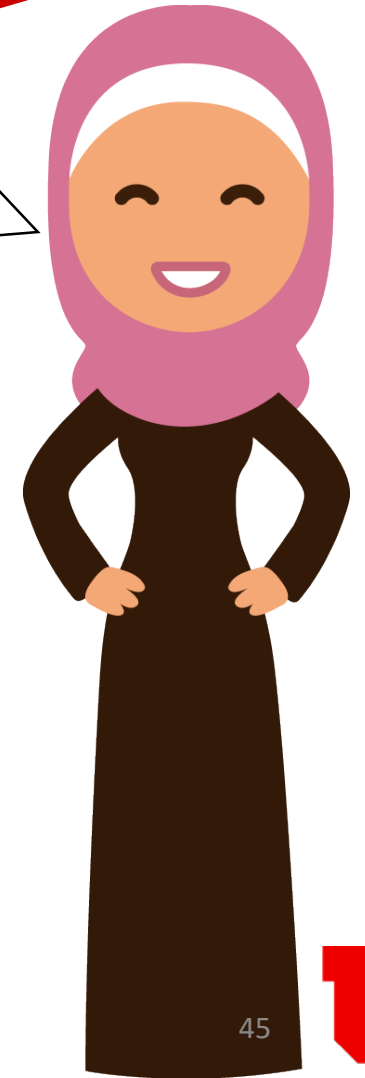
- When you model your thinking, what are things that you “just know”?
- That tells you what **background knowledge** is needed for your topic.
- Is there **specialized vocabulary**? Can you say it another way or do you need to teach those words?



Speak Their Language

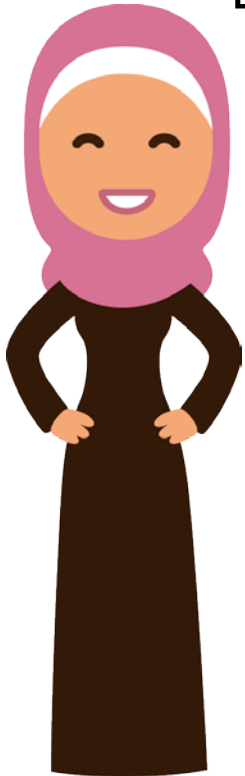
- Elementary
 - Can you talk about the topic without using big words?
- Middle and High School
 - Gauge familiarity with vocab. "Remind" students what it means.
- Start with the question and its importance. Introduce vocab if required.
- If learning new vocab, do a quick recall several times during lesson ("What's that called again?")

We're going
to explore
~~buoyancy~~
why stuff
floats!



The Role of Background Knowledge

Expert Knowledge



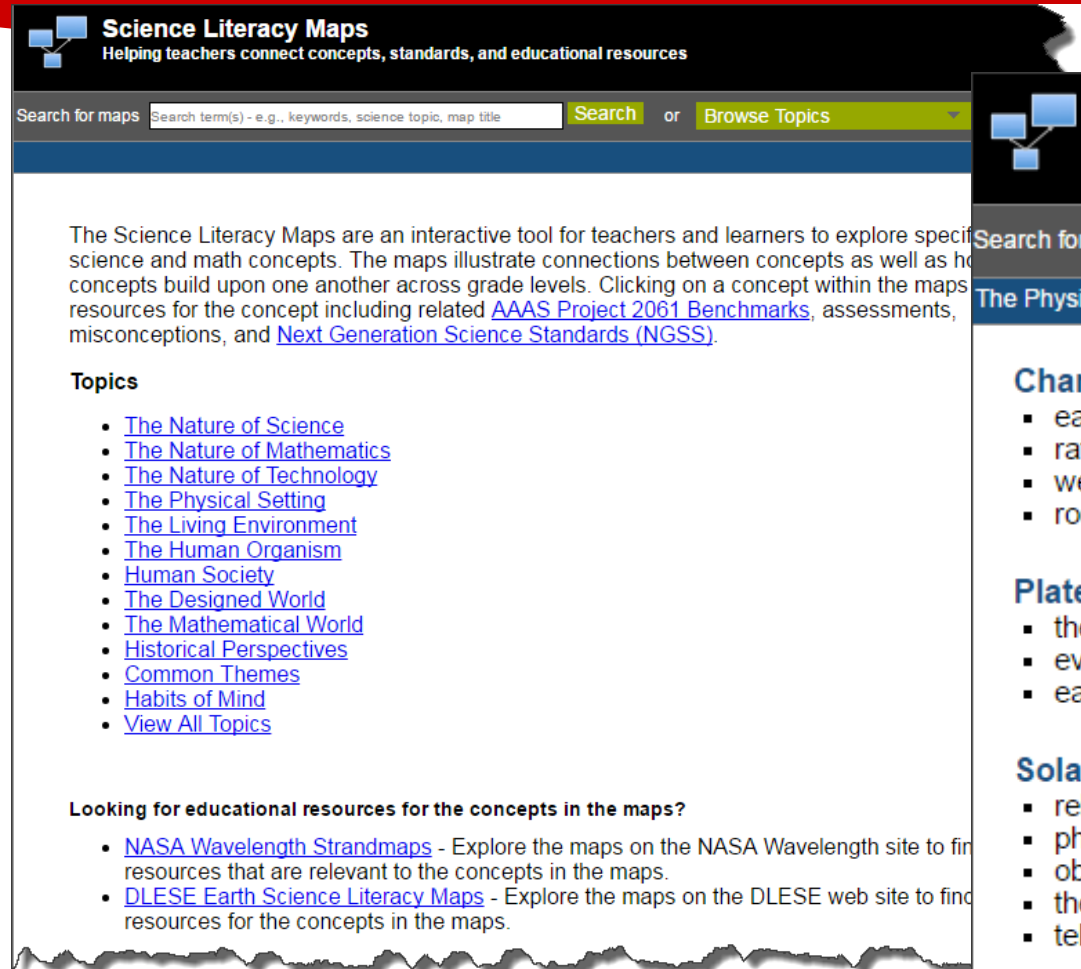
- Highly structured
- New concepts readily integrated
- Connections between relevant concepts easily activated
- Inferences generated easily
- Importance of information easy to understand

Novice Learner



- Lacks foundational ideas
- Little if any structured organization
- Relevant prior knowledge must be specifically activated
- Connections need to be made between relevant concepts
- Inferences difficult to make
- Importance hard to see

Science Topic? Check out Literacy Maps



Science Literacy Maps
Helping teachers connect concepts, standards, and educational resources

Search for maps **Search** or **Browse Topics**

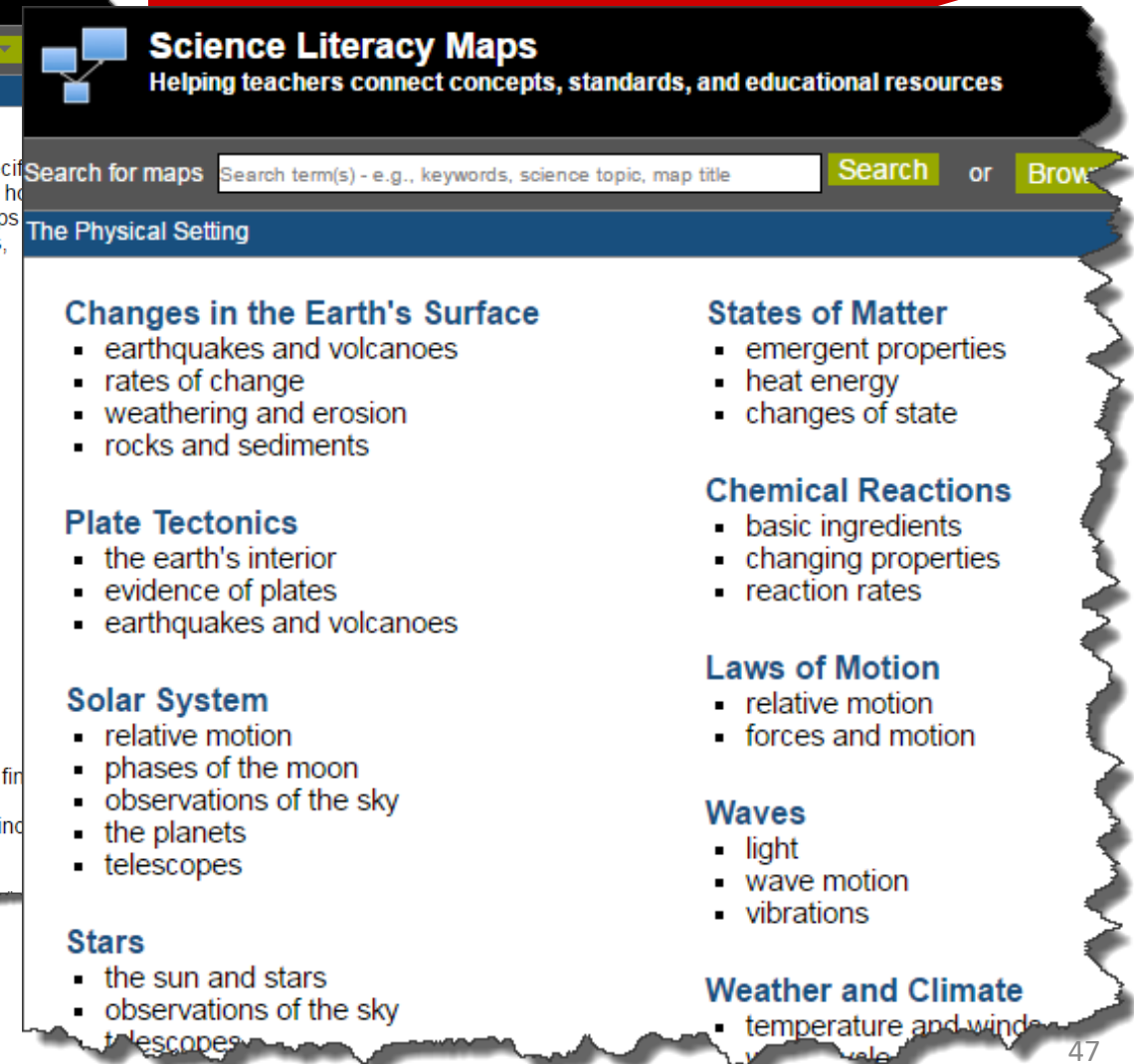
The Science Literacy Maps are an interactive tool for teachers and learners to explore specific science and math concepts. The maps illustrate connections between concepts as well as how concepts build upon one another across grade levels. Clicking on a concept within the maps provides resources for the concept including related [AAAS Project 2061 Benchmarks](#), assessments, misconceptions, and [Next Generation Science Standards \(NGSS\)](#).

Topics

- [The Nature of Science](#)
- [The Nature of Mathematics](#)
- [The Nature of Technology](#)
- [The Physical Setting](#)
- [The Living Environment](#)
- [The Human Organism](#)
- [Human Society](#)
- [The Designed World](#)
- [The Mathematical World](#)
- [Historical Perspectives](#)
- [Common Themes](#)
- [Habits of Mind](#)
- [View All Topics](#)

Looking for educational resources for the concepts in the maps?

- [NASA Wavelength Strandmaps](#) - Explore the maps on the NASA Wavelength site to find resources that are relevant to the concepts in the maps.
- [DLESE Earth Science Literacy Maps](#) - Explore the maps on the DLESE web site to find resources for the concepts in the maps.



Science Literacy Maps
Helping teachers connect concepts, standards, and educational resources

Search for maps **Search** or **Browse Topics**

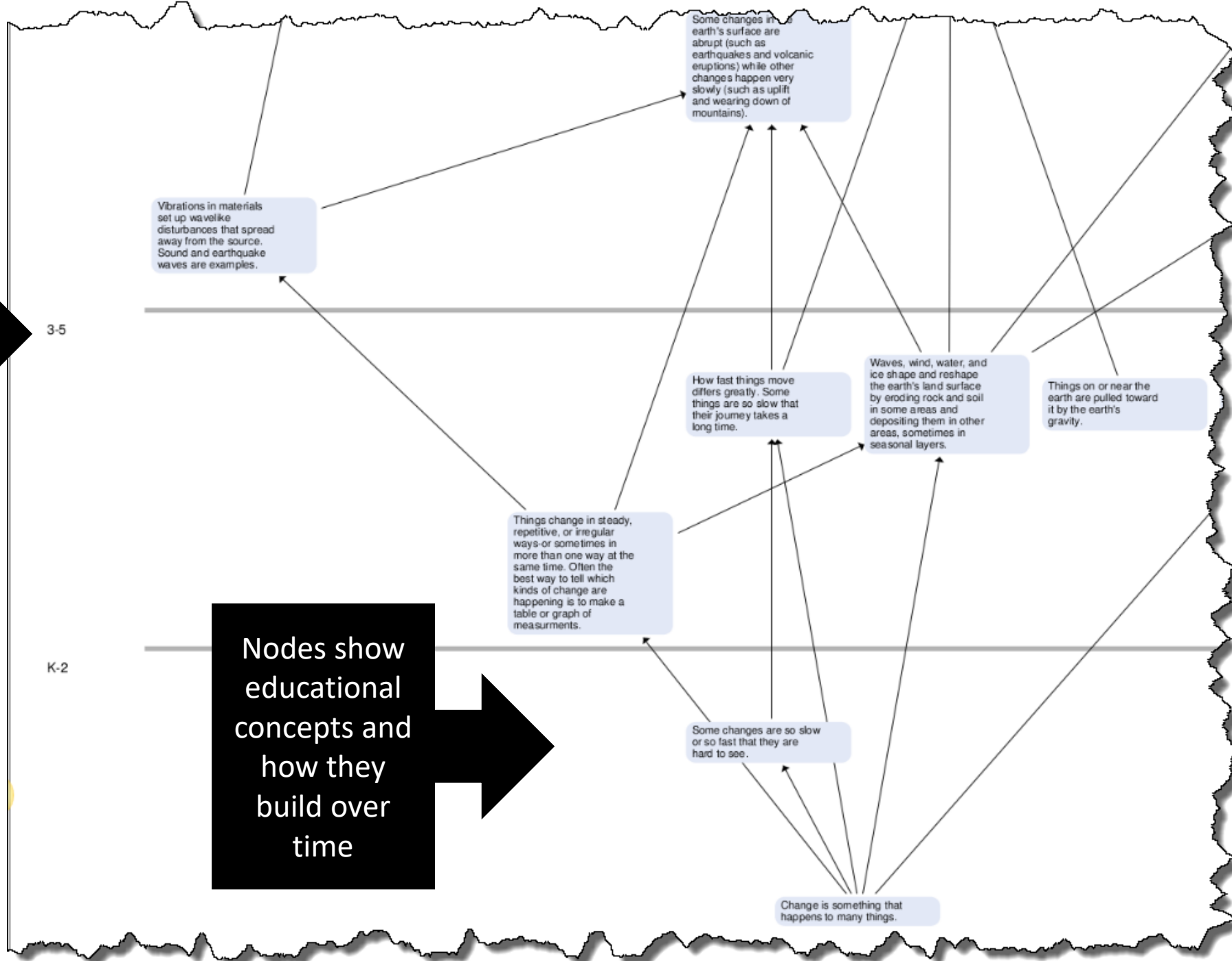
The Physical Setting

- Changes in the Earth's Surface**
 - earthquakes and volcanoes
 - rates of change
 - weathering and erosion
 - rocks and sediments
- Plate Tectonics**
 - the earth's interior
 - evidence of plates
 - earthquakes and volcanoes
- Solar System**
 - relative motion
 - phases of the moon
 - observations of the sky
 - the planets
 - telescopes
- Stars**
 - the sun and stars
 - observations of the sky
 - telescopes
- States of Matter**
 - emergent properties
 - heat energy
 - changes of state
- Chemical Reactions**
 - basic ingredients
 - changing properties
 - reaction rates
- Laws of Motion**
 - relative motion
 - forces and motion
- Waves**
 - light
 - wave motion
 - vibrations
- Weather and Climate**
 - temperature and wind
 - weather

<http://strandmaps.dls.ucar.edu/>



Grade Level
at left



Nodes show
educational
concepts and
how they
build over
time



Communicating with Kids

- **Smile!** Use gestures. Be animated.
- Show your **excitement and enthusiasm**
- Emphasize the **process**
- Praise specific *effort (not results)*
 - Sustains activity & reduces frustration
 - "Good work on looking for new evidence."
 - "I like that I can hear you thinking through your ideas! That's great!"



Step 5: Choose Activities & Scaffolding

- **How long** do you have? Account for:
 - Setup time
 - Instructions
 - Clean up time
 - Recess times? They might need this!!
- **What materials/equipment?**
 - Hands-on materials?
 - Technology?
 - Safety equipment?
- How will you **scaffold thinking** during the activity?!

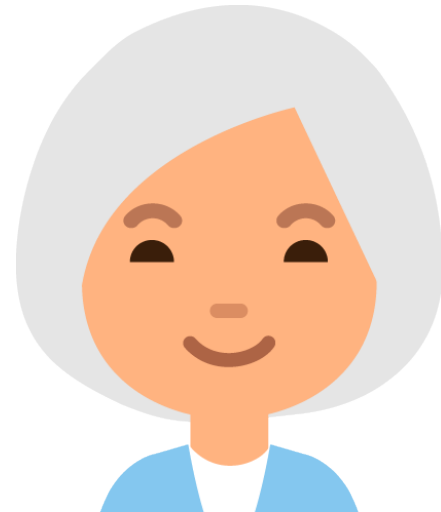


Image Credit: http://missoulain.com/news/local/hellgate-elementary-students-make-artificial-snow-in-science-lesson/article_052f84c3-a21b-55d2-8b5e-31a6efe4ba74.html

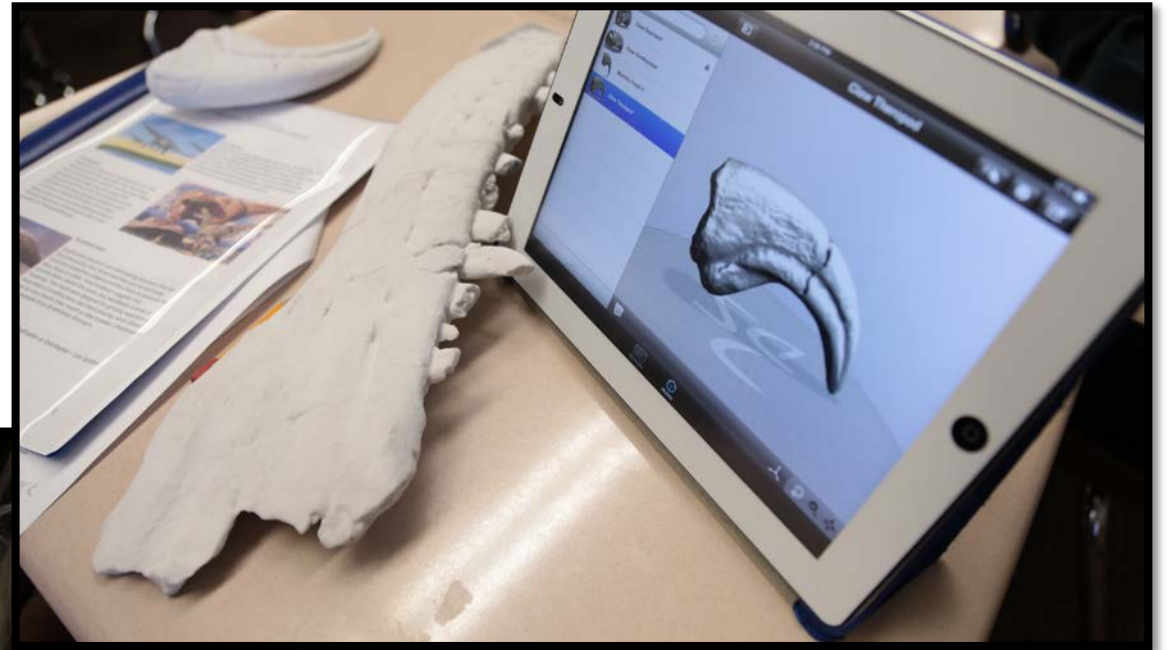
Scaffolding for Facilitator Demos

- Be sure have set up a **key question**
- Ensure that student make **concrete predictions**
- Have students **compare their predictions to results**
- **Demonstrate failure.** Have students explain why it works vs. doesn't work.

Interactive is best. But demos are OK when there is danger, materials are very expensive, or artifacts are very fragile



Are there creative ways to get around fragile or expensive objects?



3D Prints and 3D virtual models of paleontology objects from Natural History Museum of Utah.

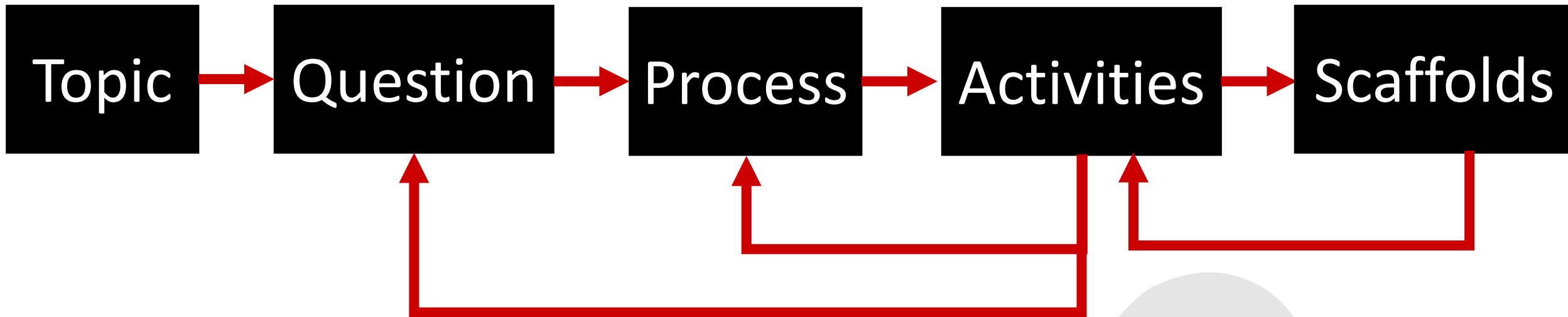
Brainstorming Activities

- **Concrete, hands-on** inquiry is best
- **Little prep.** Or prep can be done before arrival.
- How can you mimic **real processes** in your field?
 - Think about materials you use
 - Think about goals you set
 - Think about your favorite tasks

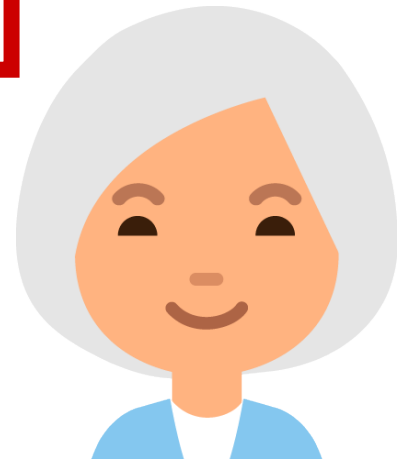
If you use models for abstract ideas (e.g., Legos to show molecular changes), discuss how the model does and does not represent reality



Revising and Refining Your Session



Scaffolds are question and materials that encourage deeper processing during your activity




Meaningful Generation during Learning

- Help students **organize and document ideas and findings**
- Try to **limit writing** (they won't do as much as you'd like) but **maximize thinking**
- Confusion often precipitates learning. Model it. **Welcome it.** Full success = shallow thinking.

SECTION 2 (continued)
What type of dinosaur did these bones come from?

STEP 10

1 Key features of MYSTERY FOSSIL #2 

	ORNITHISCHIAN	SAUROPOD	THEROPOD
1. It has one knob on one end and two smaller knobs on the other end.			
2.			
3.			
4.			
5.			

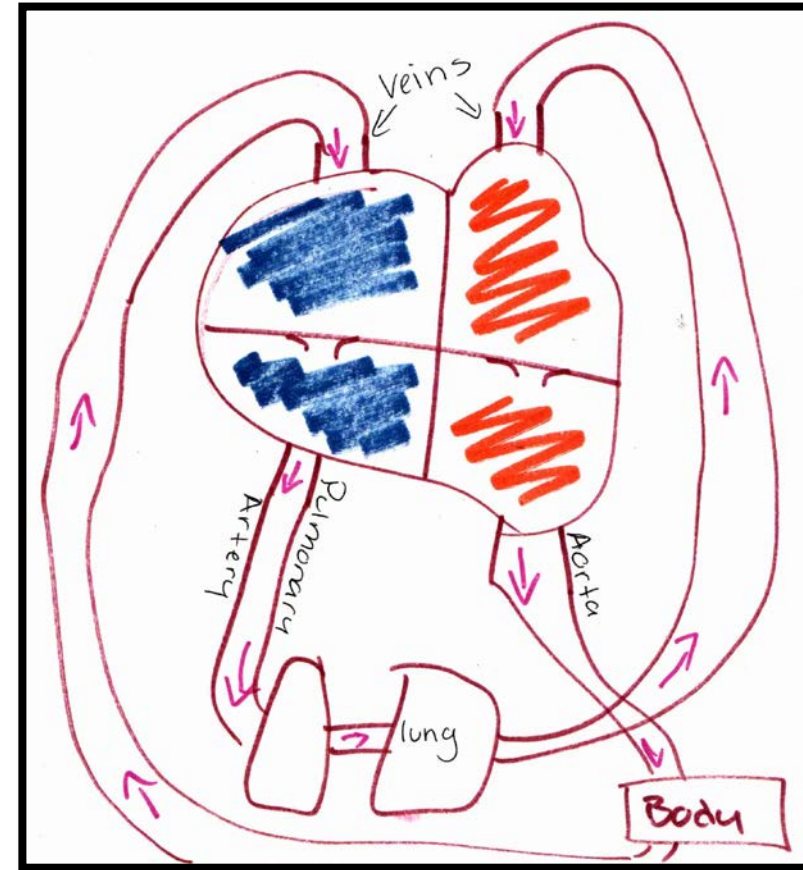
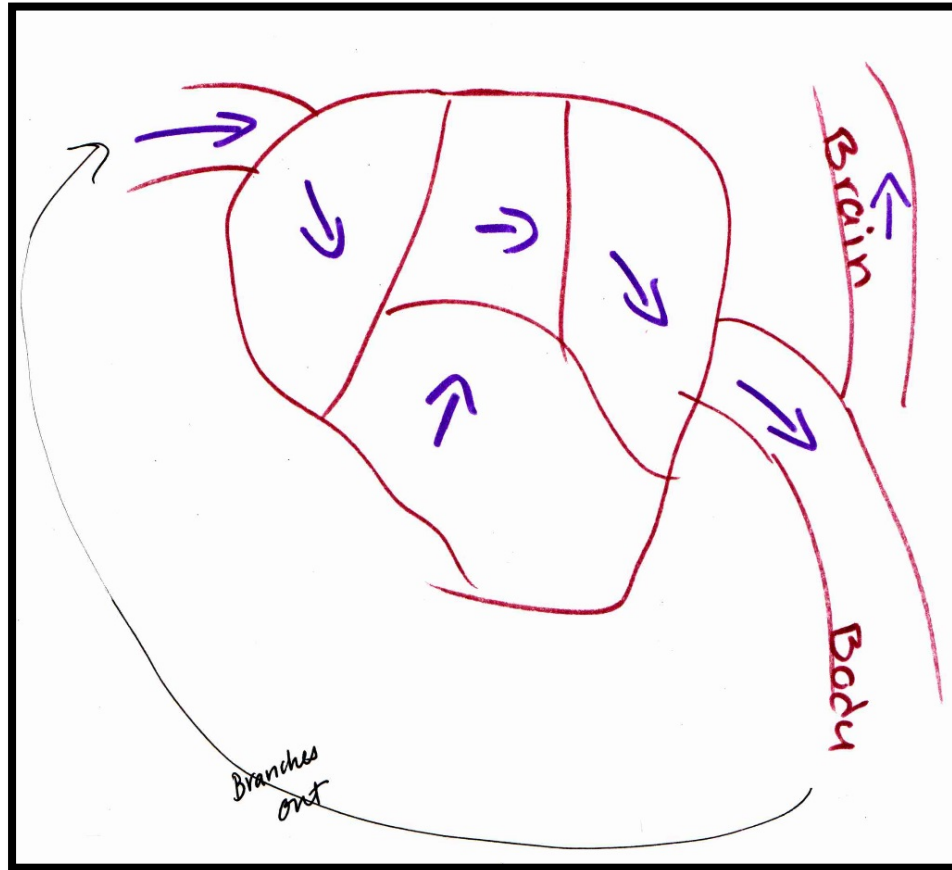
2 **Next**, analyze the data in the charts for Mystery Fossil #1 & #2 and discuss with your partner: Which TYPE of dinosaur does your evidence point toward? (circle one)

	Ornithischian	Sauropod	Theropod
--	---------------	----------	----------

3 **Now**, discuss with your partner: Mystery Fossils #1 & #2 provide strong evidence for the TYPE of dinosaur, but weak evidence for the SPECIES of dinosaur. Why might this be?

55

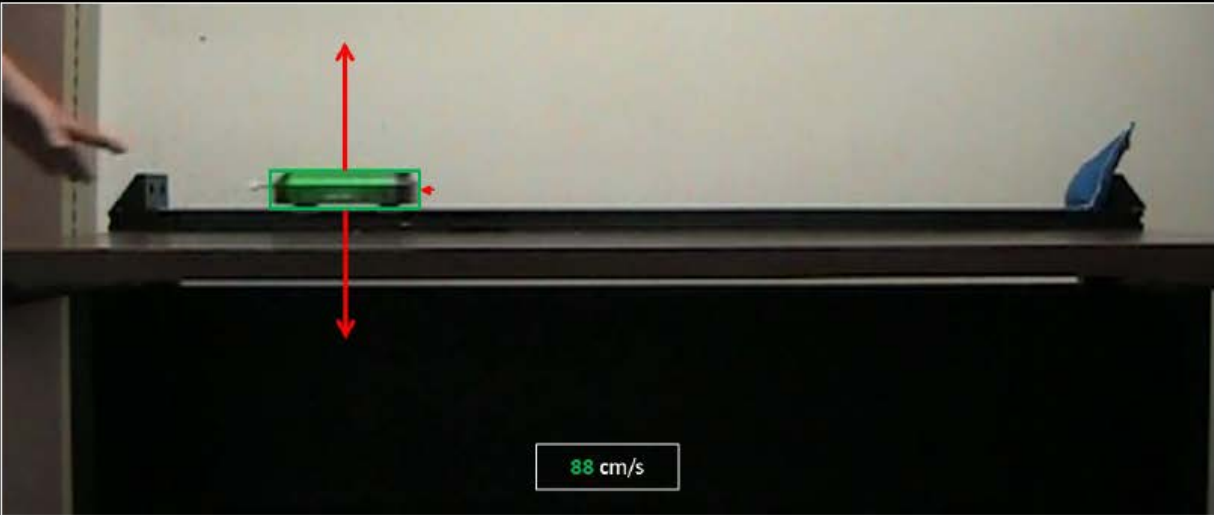
Drawing and Explaining Models



Explaining Examples and NonExamples

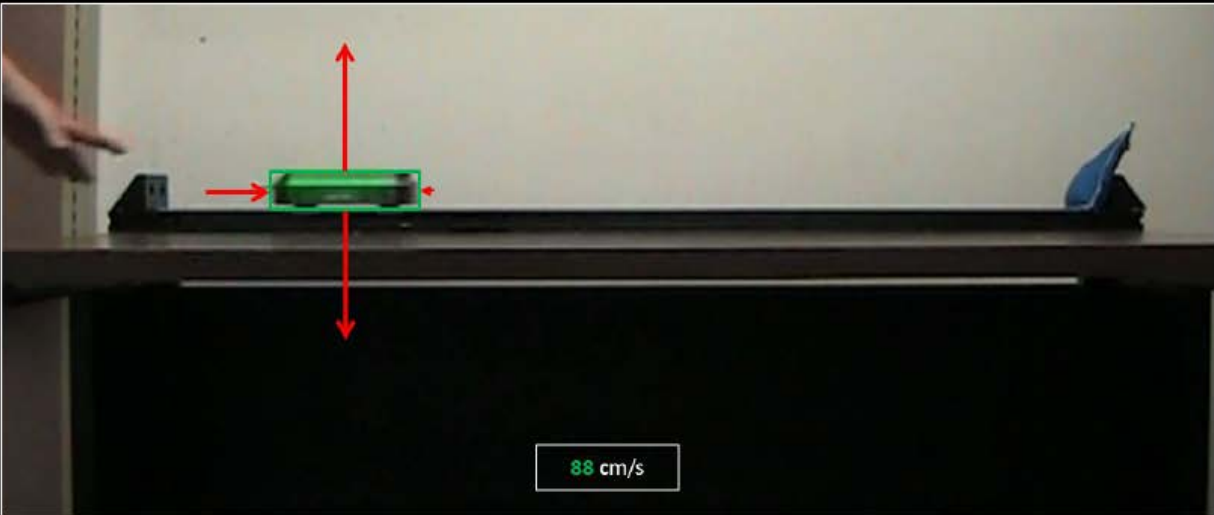
4

Correct
✓



38 cm/s

Incorrect
✗



38 cm/s

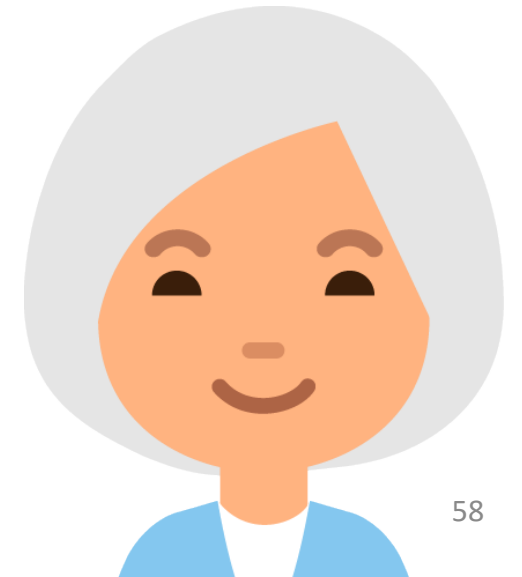
The image displays two sequential frames of a physics experiment on an air track. In the top frame, labeled 'Correct', a green block is shown on the track with a red arrow pointing to the right and a red arrow pointing upwards. A speedometer at the bottom indicates 38 cm/s. In the bottom frame, labeled 'Incorrect', the same green block is shown with a red arrow pointing to the right, a red arrow pointing upwards, and a red arrow pointing to the left. The speedometer at the bottom also indicates 38 cm/s. The number '4' is in the top right corner of the frame.

Scaffolding Deep Thinking

Deep Question Stems

- What would happen if ?
- Why does ...? What makes ... ?
- What is the difference between ... ?
- Why would you expect ... ?
- How can ... ? How do you know ...?
- Why is _____ an example of ... ?
- Why is _____ not an example of ...?

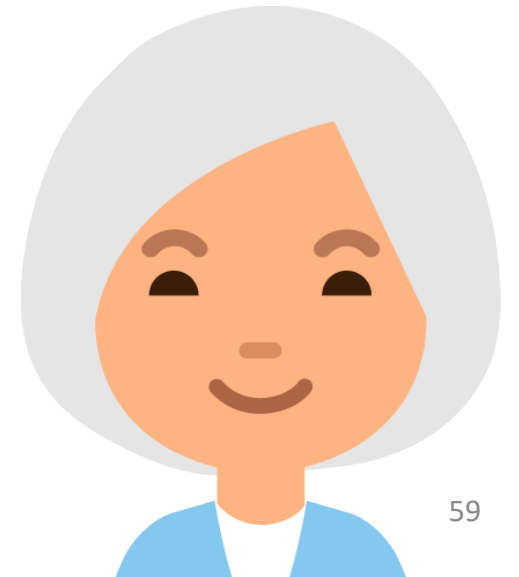
These work only if you didn't already talk about the answers!



Scaffolding Deep Thinking

Process Prompts

- What are you thinking?
- Tell me about what you are finding.
- I'd like to hear your ideas. How did you come up with them?
- How did you figure that out?
- What other ideas did you consider? What made you reject them?



Outline Your Activities and Scaffolds

Brownies Activity: Friday, 3/24

- Random draw endangered animal groups as enter (5 min)
 - Black Footed Ferret
 - Red Wolf
 - Przewalski's Horse
- Welcome & introduction (5 min)
- Activity 1: Efficient Web Search and Fair Use Images (25 min)
 - Example endangered animal: Karner Blue Butterfly
 - Google Image Search (10 min)
 - *What are usage rights? Why should we respect them?*
 - How to refine by usage rights
 - How to refine by size (med to large for print)
 - How to save images to computer
 - **Challenge:** Find the best fair use pictures of your endangered animal
 - Google information search (15 min)
 - *How do we know when online information is good?*
 - *What should we look for when doing online research?*
 - **Challenge:** Find trustworthy, key information on your endangered animal
 - Description of your animal
 - Why is it endangered?
 - What zoos are trying to save it?
 - How can people help?
- Activity 2: Find your animal in U.S. Zoos Find closest place to visit (15 min)
 - Google Maps
 - Enter U address



Finding Hands-On Activities

1. Brainstorm activities with concrete and/or hands-on materials
2. Choose your best idea for an activity
3. What materials and questions will you use to encourage deeper thinking and learning?

10 minutes



Step 6. Monitoring and Assessment



Look and Listen: Engagement *and* Depth?!

Listening for Deep Processes

Reasoning & Confusion

- I'm not sure. I was thinking that it could be ...
- It's _____ because
- I wonder what would happen if ...
- I think _____ since _____...
- But how could we tell if that's right?

Rote Actions, Lack of Processing

- The answer is _____. I just know.
- I don't know why. Just do what she says.
- What's it say to do next?
- What's the right answer?
- [Silence]



Who is Doing More Talking? (Hopefully the kids!)

Bring Students Together for Reflection

- **Whole class reflection ensures group progress**
 - Not all students/groups may be getting same thing out of session
- **Every 10-15 minutes** often is good balance between inquiry and reflection
 - 10 for elementary
 - 15 for middle/high school

Return to Deep Questions

- What would happen if ?
- Why does ...? What makes ... ?
- What is the difference between ... ?
- Why would you expect ... ?
- How can ... ? How do you know ...?
- Why is _____ an example of ... ?
- Why is _____ not an example of ...?



Step 7: Create a Meaningful Ending

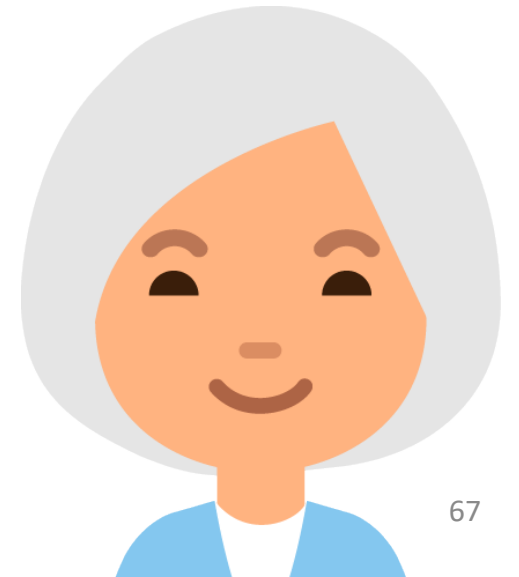
- **What was important?**
- **What is the takeaway message?**
(Ask them first. Help them generate it.)
- **How did their activities relate to the field?** (As them first. Then compare to professional activities.)



Step 7: Create a Meaningful Ending

- What are **follow-up questions** that they could explore?
 - If you have time, helps to guide them to discover follow-up questions
- What is a **follow-up activity** they could try?
- How can they **find out more about this topic**?

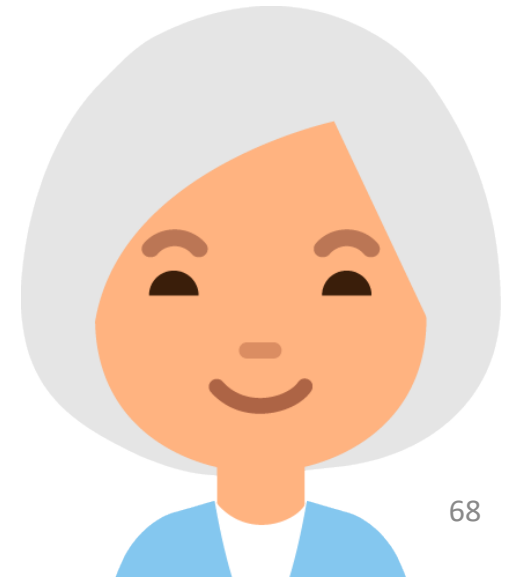
Feel free to create a handout or list of websites for the teacher



Step 8: Post-Session Reflection & Changes

- What went well?
- What seemed problematic?
- Where did students fidget or go off-task?
- Did students know what you were asking?

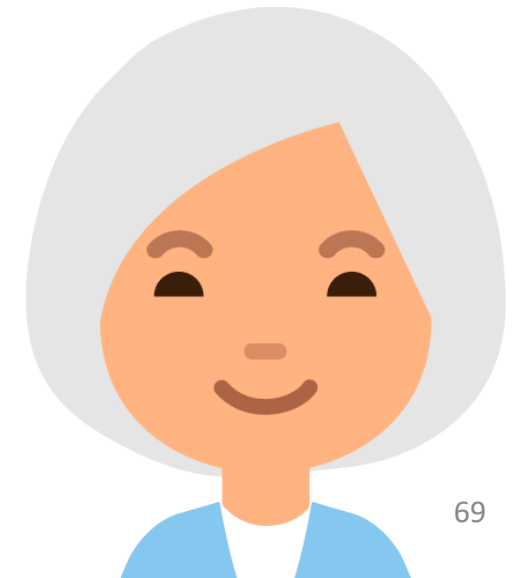
Make notes
immediately after your
session! You will forget!



Step 8: Post-Session Reflection & Changes

- **Off-task behaviors?**
 - Students not engaged?
 - Students unsure what to do?
 - Single question or goal?
- **Time issues? Flow?**
 - What slowed down the students?
 - Fidgeting? Lack of depth? Balance between instruction and student work? Students need time to dig in.
- **Practice questions with non-domain peers.** Do they know what you are asking?

Practice makes perfect.
Don't get discouraged!



Feeling Overwhelmed? Totally normal!

- Doesn't need to be perfect to be useful.
- **Processes** are as valuable as outcomes
- You will feel exhausted after a session – that's normal!
- Kids love doing something different with someone new



Feeling Overwhelmed?

Brownies Activity: Friday, 3/24

- Random draw endangered animal groups as enter (5 min)
 - Black Footed Ferret
 - Red Wolf
 - Przewalski's Horse
- Welcome & introduction (5 min)
- Activity 1: Efficient Web Search and Fair Use Images (25 min)
 - Example endangered animal: Karner Blue Butterfly
 - Google Image Search (10 min)
 - *What are usage rights? Why should we respect them?*
 - How to refine by usage rights
 - How to refine by size (med to large for print)
 - How to save images to computer
 - **Challenge:** Find the best fair use pictures of your endangered animal
 - Google information search (15 min)
 - *How do we know when online information is good?*
 - *What should we look for when doing online research?*
 - **Challenge:** Find trustworthy, key information on your endangered animal
 - Description of your animal
 - Why is it endangered?
 - What zoos are trying to save it?
 - How can people help?
- **Activity 2: Find your animal in U.S. Zoos Find closest place to visit (15 min)**
 - Google Maps
 - Enter U address
 - Directions to zoo address
 - Save map link
- Activity 3: Graphic Design (Infographic) –Piktochart.com (25 min)
 - *What makes a poster look good? What catches your eye?*
 - *Discuss example and nonexamples of good design.*
 - Interactive guidance on Picktochart
 - Background (contrast with text)
 - Adding images
 - Adding text
 - **Challenge:** Create infographic on your endangered animal
- **Activity 4: Share your design (Program Tweet via @IDETProgram) (10 min)**
 - What is Twitter?
 - Internet safety
 - See results of our live Tweeting



Practical Tips

- Take your planned activities, *cut them in half*
- Do the activities *as if you were a student*. Time yourself.
 - Multiply by 4 for elementary school
 - Multiply by 3 for middle and high school
- Assign **target times** to each activity
 - Have an "emergency jettison" plan
- Quick finishers? Helpers!
- Expect the unexpected
 - Fire drills!
 - Terrorized by a bee!



Documenting Your Outreach: Pictures!

- At the U? Media release form
- Many schools have signed media release from parents. Ask in advance.





Questions??



Download Slides?



<http://bit.ly/2oaV0ts>

