




# ***Formative Evaluation of Student Work: A Venue for Reflective Practice***

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# Agenda

- Sweet Introductions/expectations
  - Activity with cartoons
  - Activity discussion
  - Mini-lecture on tool
  - The Why and How of Reflection?
- 

# Introductions/Expectations

- Please be guided by the chocolates to sit



STEM

The Snickers logo, featuring the brand name in a blue, italicized font with a white outline, set against a black background.

**SNICKERS**

STEM

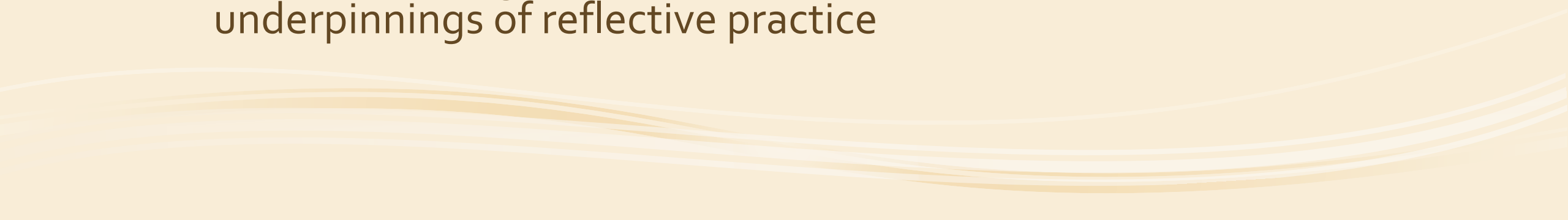


Humanities/Social  
Sciences



Humanities/Social  
Sciences

# Objectives

- Explore and use formative evaluation strategies for
    - Reflective enhancement of teaching and learning
    - Documentation of “Teaching and Educational Development”
    - Encouraging students to reflect on their learning
  - Explore and use formative assessment tools (concept cartoons) to assess students’ prior knowledge and to reflect and inform activities to improve instruction
  - Time permitting: Discuss theoretical and philosophical underpinnings of reflective practice
- 

# Activity 1: Students' Ideas and Reflection

My observations of this culture  
reinforce my belief that people  
everywhere share certain basic  
characteristics, in that they are  
base, vulgar, crude, stupid and  
totally without redeeming merit...



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**AIKANTUDPOLOGY**

# Activity 1: Reflective Journals on Concept Cartoons

- Each students will get handout 1.
- Each group will get a concept cartoon.



On your own: BEFORE DISCUSSION (5 minutes)

Examine cartoon and fill first box in  
**Handout 1**



Group Discussion (10 minutes):  
Discuss which do you think is the  
best response



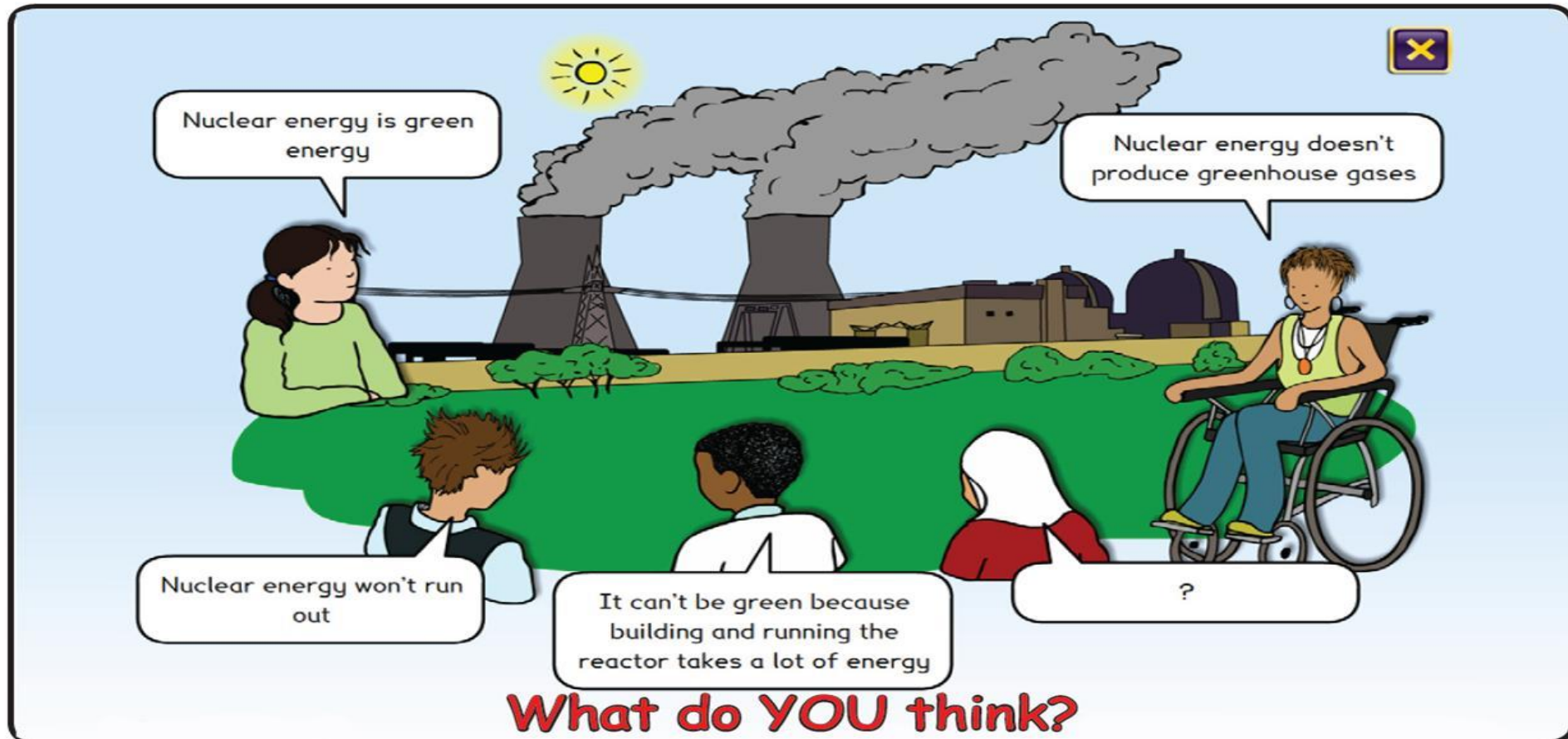
Complete second box after Group  
Discussion



# What are concept cartoons

Follow up 

## 3.6 Is nuclear energy green?



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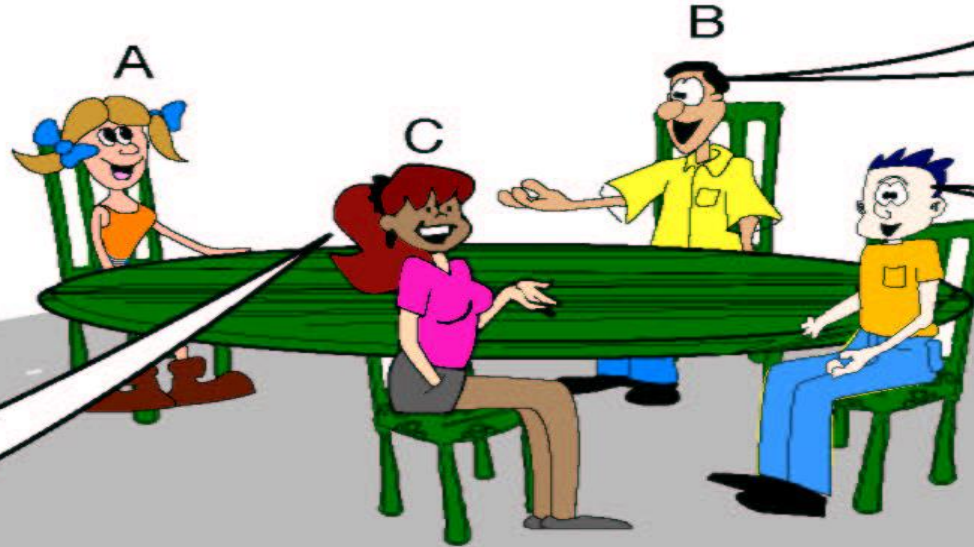
# Are we all the same inside?

Although we look different on the outside, we are all the same inside.

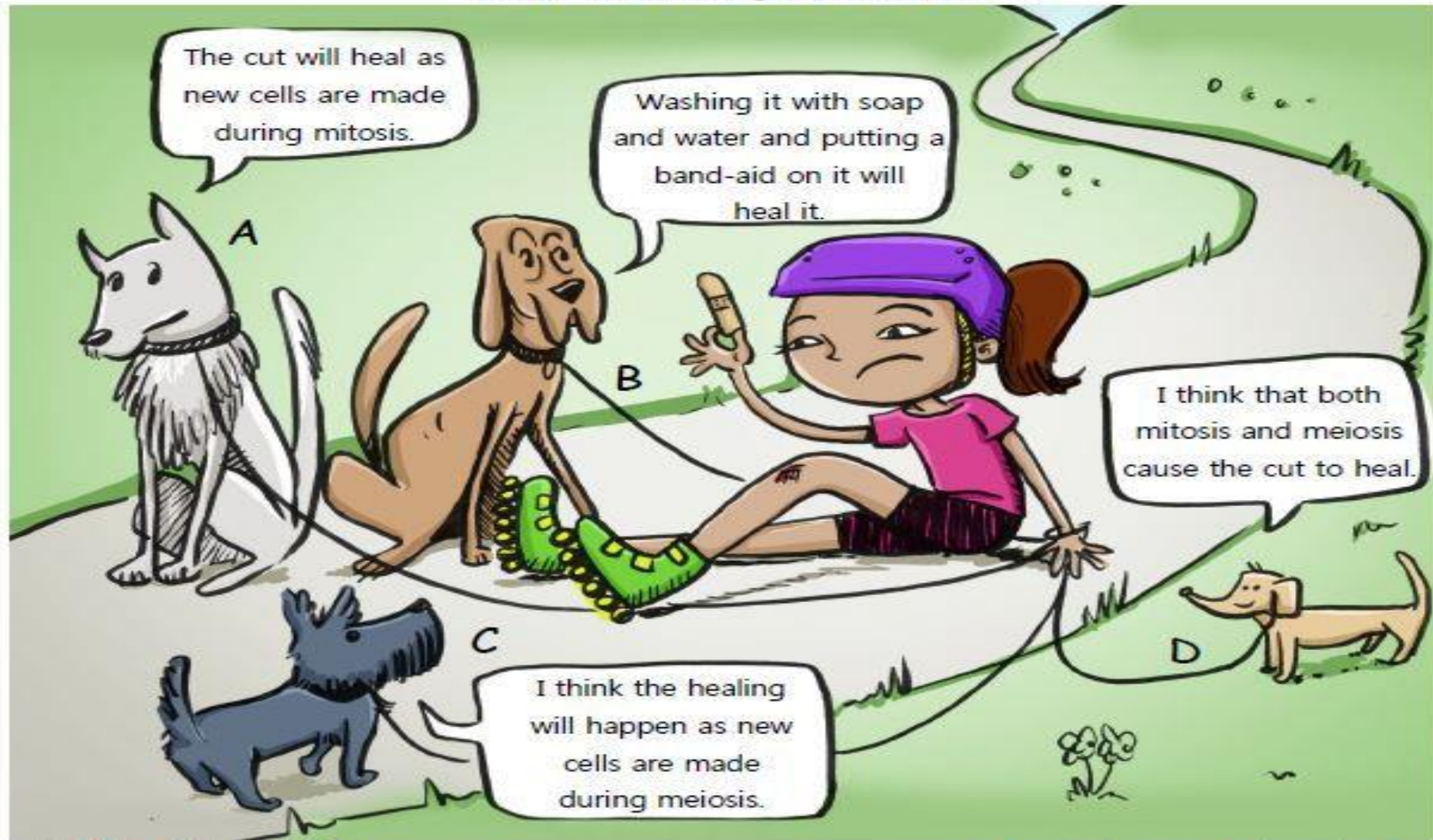
Any differences inside come from changes in how we grow. Genes are not involved!

I think that we have differences. My blood type is different from my sister's.

There are male and female differences, but that's all.



## How will the girl's cut heal?



Chemical reactions get hot

Some chemical reactions stay the same temperature


Chemical reactions need to be heated to get them started

Some chemical reactions get colder

?


**What do YOU think?**

# Activity Discussion

- Please save your journals for a follow up activity.
  - Questions:
    - What are you thought about the activity? What do you think are its objectives?
    - How would you assess what you just created
    - What can you learn from them?
    - How do they compare to assessments you do in your area?
- 

# From the beginning: Constructivism

# Student's Prior Knowledge (Alternative Conceptions)

1. Students come to our classrooms already holding their own ideas about natural and social phenomena that they have developed through everyday experiences: NO TABULA RASA
  2. Some of these ideas maybe at odds with accepted views “alternative conceptions”
  3. These ideas are the result of students' active efforts to make sense of the world and so students tend to hold on them.
- 

## Transfer versus Constructivist views of Learning

# How do we learn?

### Transfer View :

- Knowledge is the possession of teachers: the teacher transmits knowledge
- In contrast to the teacher, the pupil is empty headed (Blank slate)
- The teacher's job is to pass the knowledge on to the pupil: the teacher is active.
- In contrast to the teacher, the student is passive in simply accepting the knowledge from the teacher.

### Constructivist View:

An alternative way of viewing the learning process might incorporate the following points:

- i. Students come to science lessons already holding their own ideas about natural phenomena which they have developed through everyday experiences: students are not blank slates.
- These prior ideas interact with new experiences and phenomena: students make linkages between prior ideas and new experiences.

# Formative Assessment and Evaluation

Identify and  
elicit students'  
commonly held  
ideas and  
Alternative  
Conceptions

Assessment of Learning

Help students  
reflect on their  
learning  
(Metacognition)

Assessment FOR and AS Learning

Aid instructors  
to reflect on  
their teaching  
and its  
effectiveness



# CONCEPT CARTOONS

Special thanks to Dr. BouJaoude from AUB as the part on CONCEPT CARTOONS is adapted from a workshop he developed

# Identifying students' Alternative Conceptions

- **Concept cartoons:** Concept Cartoons are cartoon-style drawings that put forward a range of viewpoints about an everyday event.

# Concept Cartoons

- Concept Cartoons are cartoon-style drawings that put forward a range of viewpoints about an everyday event.
- Their features include:
  - presentation of alternative ideas about a concept, including the scientifically acceptable stance;
  - the use of visual images;
  - minimal use of written language; and
  - contexts that are familiar to children.

# Concept Cartoons: The theory

- This strategy takes account of constructivist views of learning, that is, taking students' ideas into account when planning teaching. By presenting a number of possible alternatives, "cognitive conflict" generates conditions for learning readiness.
- It also draws on research into common areas of misunderstanding in science.

# Concept Cartoons: When to use them

- At the beginning or part way through a unit of work, to:
  - gain an indication of the range of students' ideas within the class;
  - identify areas of alternative conceptions ;
  - stimulate starting points for investigations;
  - offer challenges that may lead to restructuring of ideas.
- At the end of a unit of work to:
  - review learning

## Concept Cartoons: How the strategy works

- Concept cartoons stimulate students to discuss their ideas, including those that are normally reluctant to do so. This gives teachers access to those ideas. It also gives students access to each other's ideas, which may prompt them to reconsider their own.
  - The visual cartoons and minimal written text provide a valid assessment strategy for students with poor literacy skills, reluctant learners, and English language learners.
  - Concept cartoons appear to reduce the risk of fear of giving a "wrong" response.
- \* English for Speakers of Other Languages (ESOL)

# Concept Cartoons: How to do it

- Present the concept cartoon to individual students, small groups, or the class.
- Ask them to comment on each statement or ask them to indicate which statement they agree with.
- Ask students to give a reason for their choice. This is particularly important for accessing their thinking processes.
- Encourage debate between students with different opinions.
- Follow up discussions with students setting up investigations to explore their ideas.
- Note that for some concept cartoons there may be no one right answer. "It depends on..." may be an appropriate response.

# The Why and How of Reflection for teaching and Learning?

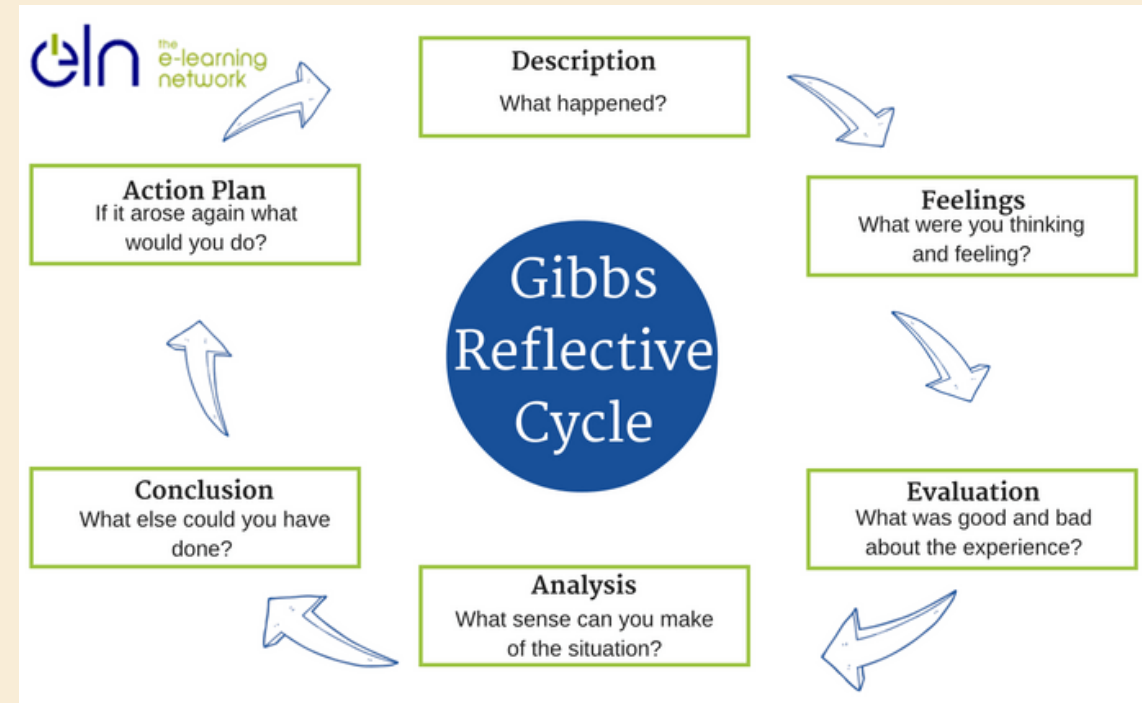
Is it true that the most important thing is how you see yourself??





# Reflective Journals and Learning Logs

- Personal record of students on their learning
- Typically, instructor asks students to record learning using **PROMPTS** that stimulate thinking.
- Thought of as a meta-cognitive tool that encourages **CRITICAL** thinking
- Please check Handout 2



# Yet More Concept Cartoons





# Activity 3: Observation of Natural Object/Organism

- Go around describing the organism on the screen:
  - First round: Tell us a first impression from your place.
- Second round:
  - Take a few minutes to observe; You can come closer and look at closely.
  - Please write down the characteristics words about the organism and then tell them to me



# Discussion

Whole class :

- How were the two rounds similar and different?
- What can we learn about the organism from observing and describing?
- What additional characteristics or aspects became visible to you in the second round?
- How can this activity of relate to assessing our students?

- Think about:

I placed your descriptions along a continuum: can you tell what the continuum refer to? Or how are the two sides different?

**Describing vs. Inferring /Analyzing**

# What do you see?

- Activity 2: Examining student work
- Please check Handout 3.
- **Group Work:** Now revisit your reflective journals from a TEACHER perspective and examine them using **Handout 3**



# Handout 3

Describe


Analyze

Reflect




# Reflection Heuristics

## Practical Discovery

- Description vs. inference in examining students' work
  - Opening venues for multiple interpretations and examining viability, in terms of:
    - Materials that authentically demonstrate students' strengths and challenges
    - Effectiveness of activities to improve instruction
- 

# Framework


- Reflection on two levels:
    - Instructor reflection for enhanced practice
    - Students (and later as practitioner) reflection on learning and its meaning their growth
  - Create a learning community around continuous growth, reflective thinking, and creative practice (21<sup>st</sup> Century skills)
  - Philosophical reflections (Practical Wisdom/Phronesis)
    - Reflection as a way of being
- 

# Reflective Practice

Summary and Conclusion

The bottom of the slide features several decorative, wavy lines in shades of light beige and cream, creating a sense of movement and depth.


# Formative Assessment Tools: What have we explored?

- Concept cartoons
  - Reflective Journals on cartoons
  - Analysis of students' reflective journals: Examining students work reflectively for enhanced understanding and practice.
- 

# A Very Intelligent Person once said...

- To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science. (Albert Einstein)

# Reflective Practice

- Better understand what we know and do as educators
  - “learning through **questioning** and investigation to lead to a development of understanding” (Loughran, 2002)
  - Better understanding and ways to question assumptions
  - Understanding and collecting teachers’ stories and narratives
- 

# John Dewey..

Reflective Practice as embodying...


- Responsibility
- Open mindedness
- Wholeheartedness

# References

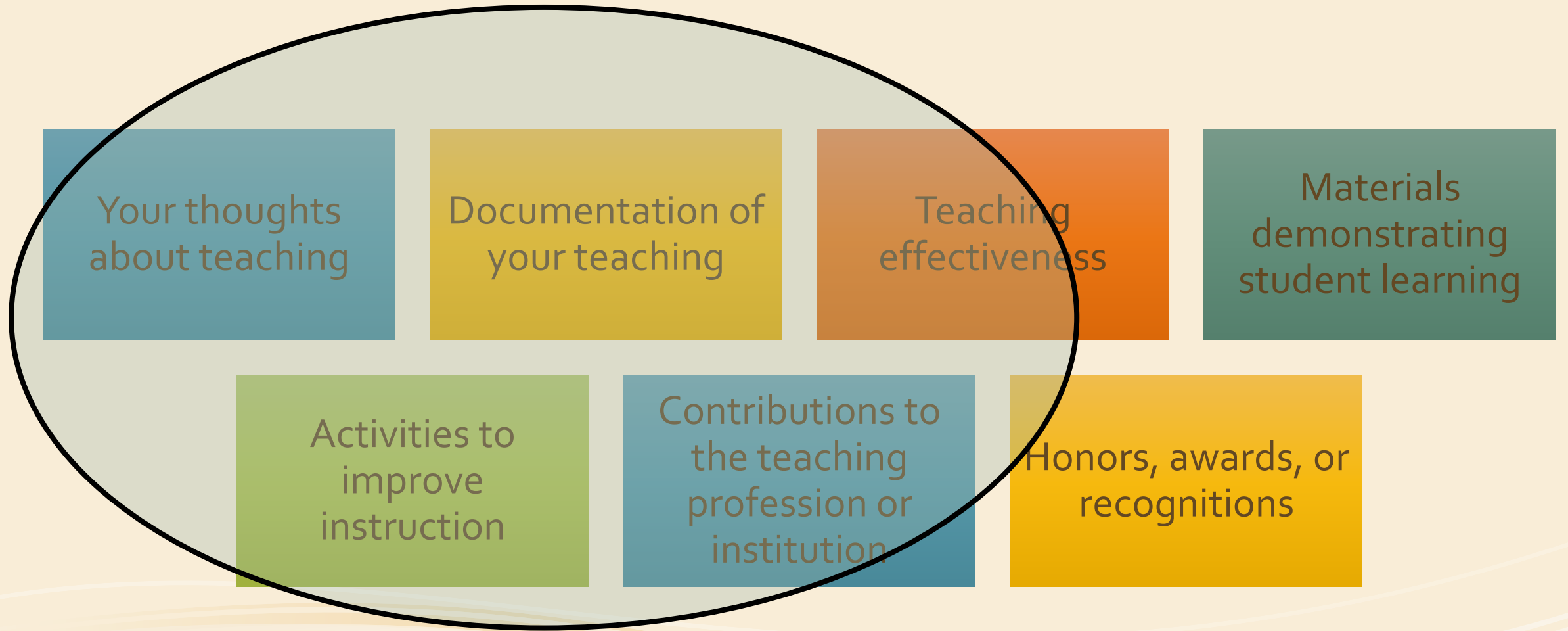
- <https://www.carolina.com/teacher-resources/Interactive/5-common-misconceptions-in-genetics/tr10631.tr>
- <https://hubpages.com/education/Lesson-Plans-Use-of-Concept-Cartoons-to-Elicit-Higher-order-Thinking-Skills-in-the-Science-Classroom>
- <https://www.sciencelearn.org.nz/resources/2567-using-concept-cartoons-to-explore-students-scientific-thinking>



# Reflective Practice

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- 

## Components of Teaching and Educational Development



# John Dewey..

Reflective Practice as embodying...

- Responsibility
- Open mindedness
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# References

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# Concept Cartoons References

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