## **MiTEP Misconception-Based-Instruction Assignment**

## **Rationale:**

Good science instruction should take into account students beliefs and ideas about science. Only by probing for understandings can teachers determine when students possess misconceptions that are in conflict with the scientific concepts targeted for instruction. When a student's misconception is identified, the teacher should create dissatisfaction in the students thinking to initiate the process of conceptual change. To initiate dissatisfaction, the teacher needs to challenge the student by providing discrepant events that forces them to question their belief compared to observable scientific phenomena. When the student experiences the discrepant event, a dialog with the teacher should discuss the scientific concept in view both of their beliefs and the discrepant event. The teacher then needs to help the student understand how science differs from beliefs and reinforce how science works. Finally, the teacher needs to guide the students in reconstruction of their knowledge (*Cognitive Aspects of Learning and Teaching Science*, Mestre, J., 1992).

The major components of **Conceptual-Change - Teaching** are:

- Probing for and identifying misconceptions
- Providing discrepant events
- Guiding students in reconstructing their knowledge

Assignment Directions: Everyday you will be provided with a list of misconceptions that are typical of students learning the science concepts that we will be addressing during our field work. Based on the misconception you choose, you will need to answer each of the four steps below:

- 1. Explain why this is a misconception by explaining the correct scientific concept.
- 2. Identify and describe how you would use a discrepant event to help students find dissatisfaction with their misconception.
- 3. Relate what you would say to a student that would help guide the student to reconstruct his or her knowledge.
- 4. Identify other misconceptions that occur to you as a result of today's experiences.

## Daily Misconception Assignment Assessment Criteria

	Excellent	Satisfactory	Needs
	Executiv	Satisfactory	Improvement
1. Explain why	Thoroughly	Explained why this	Provided a weak
this is a	explained why this	is incorrect by	explanation and
misconception by	is incorrect by	addressing the	some of the
explaining the	addressing the	correct scientific	explanation was not
correct scientific	correct scientific	understanding.	based on correct
concept.	understanding.	anderstanding.	scientific
сопсери	anderstanding.		understanding.
	5 4	3 2	1 0
2. Identify and	Thoroughly	Described an event	Event or activity
describe how you	described an event	or activity that is	described is not
would use a	or activity that will	likely to force	likely to force
discrepant event to	force students to	students to question	students to question
help students find	question their	their understanding	their understanding
dissatisfaction with	understanding of the	of the	of the
their	misconception	misconception	misconception
misconception.	addressed in step 1.	addressed in step 1.	addressed in step 1.
misconception.	addressed in step 1.	dadressed in step 1.	dadressed in step 1.
	5 4	3 2	1 0
3. Relate what you	5 4 Created a dialogue	3 2 Created a dialogue	1 0 Dialogue between
3. Relate what you would say to a	_	_	-
	Created a dialogue	Created a dialogue	Dialogue between
would say to a	Created a dialogue between teacher and	Created a dialogue between teacher and	Dialogue between teacher and student
would say to a student that would	Created a dialogue between teacher and student predicting	Created a dialogue between teacher and student predicting	Dialogue between teacher and student predicting what
would say to a student that would help guide the	Created a dialogue between teacher and student predicting what each might say	Created a dialogue between teacher and student predicting what each might say	Dialogue between teacher and student predicting what each might say is
would say to a student that would help guide the student to	Created a dialogue between teacher and student predicting what each might say that undoubtedly	Created a dialogue between teacher and student predicting what each might say that most likely will	Dialogue between teacher and student predicting what each might say is not likely to
would say to a student that would help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal
would say to a student that would help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the
would say to a student that would help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to
would say to a student that would help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0
would say to a student that would help guide the student to reconstruct his or	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.  5 4 Listed at least three	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.
would say to a student that would help guide the student to reconstruct his or her knowledge.	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0
would say to a student that would help guide the student to reconstruct his or her knowledge.  4. Identify other misconceptions that occur to you	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.  5 4 Listed at least three misconceptions that are in some way	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.  3 2 Listed at least two misconceptions that are in some way	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0  Listed at least one
would say to a student that would help guide the student to reconstruct his or her knowledge.  4. Identify other misconceptions	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.  5 4  Listed at least three misconceptions that	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.  3 2  Listed at least two misconceptions that	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0  Listed at least one misconception that
would say to a student that would help guide the student to reconstruct his or her knowledge.  4. Identify other misconceptions that occur to you	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.  5 4 Listed at least three misconceptions that are in some way	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.  3 2 Listed at least two misconceptions that are in some way	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0  Listed at least one misconception that is in some way
would say to a student that would help guide the student to reconstruct his or her knowledge.  4. Identify other misconceptions that occur to you as a result of	Created a dialogue between teacher and student predicting what each might say that undoubtedly will help guide the student to reconstruct his or her knowledge.  5 4  Listed at least three misconceptions that are in some way related to the day's	Created a dialogue between teacher and student predicting what each might say that most likely will help guide the student to reconstruct his or her knowledge.  3 2  Listed at least two misconceptions that are in some way related to the day's	Dialogue between teacher and student predicting what each might say is not likely to accomplish the goal of helping the student to reconstruct their knowledge.  1 0  Listed at least one misconception that is in some way related to the days

Comments: