# 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

**<u>Assignment Directions:</u> 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.**

**Teacher Name:**_____ **Date:**_____

**Daily Misconception Assignment Assessment Criteria**

| | **Excellent** | **Satisfactory** | **Needs Improvement** |
|---|---|---|---|
| **1. Explain why this is a misconception by explaining the correct scientific concept.** | Thoroughly explained why this is incorrect by addressing the correct scientific understanding. | Explained why this is incorrect by addressing the correct scientific understanding. | Provided a weak explanation and some of the explanation was not based on correct scientific understanding. |
| | **5 4** | **3 2** | **1 0** |
| **2. Identify and describe how you would use a discrepant event to help students find dissatisfaction with their misconception.** | Thoroughly described an event or activity that will force students to question their understanding of the misconception addressed in step 1. | Described an event or activity that is likely to force students to question their understanding of the misconception addressed in step 1. | Event or activity described is not likely to force students to question their understanding of the misconception addressed in step 1. |
| | **5 4** | **3 2** | **1 0** |
| **3. Relate what you 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. |
| | **5 4** | **3 2** | **1 0** |
| **4. Identify other misconceptions that occur to you as a result of today's experiences.** | Listed at least three misconceptions that are in some way related to the day's activities. | Listed at least two misconceptions that are in some way related to the day's activities. | Listed at least one misconception that is in some way related to the days activities. |
| | **5 4** | **3 2** | **1 0** |

Comments: