



## Supporting Students in Science Thinking and Writing

*Workshop #2: Learning Tasks & Teaching Strategies*

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## Agenda

- Activity - Discuss Learning Task
- Discussion - Lessons Learned & Questions
- Presentation - Videos of Teaching Strategies
- Activity - Integrate teaching strategy into future lesson

*Dinner*

- Discussion - Share Teaching Strategies
- Presentation - Video of Classroom Talk
- Activity - Analyze Classroom Talk
- Logistics and Wrap-up



## Activity: Discuss Learning Task

- Work in Grade Level groups from the previous workshop
- Share samples of student writing
- Discuss the writing and the lesson:
  - How did you introduce CER?
  - What went well during the lesson?
  - What challenges arose?
  - What were the strengths and weaknesses of your students' writing?
  - What did you learn that you hope to address or apply in your next CER lesson?



## Discussion: Lessons Learned and Questions

- What did you learn that you hope to address or apply in your next CER lesson?
  - Challenges? Successes?
- What did you learn from your discussion with your colleagues?
- What remaining questions do you have?



## Teaching Strategies

1. Discuss the framework
2. Connect to everyday examples
3. Provide a rationale
4. Connect to other content areas
5. Model and critique examples
6. Provide students with feedback
7. Have students engage in peer critique



## Discuss the Framework

Discuss the Framework



## Provide a Rationale

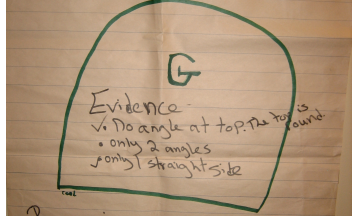
Provide a Rationale

## Connect to Other Content Areas

Connect to Other Content Areas

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Shape G is not a triangle. Because it does not have a angle on top. And that's why it's not a triangle.



Reason:

A triangle must have 3 straight sides not only 1. The is round/triangle have only straight sides. A triangle must have 3 angles this shape has two.

## Model and Critique Examples

Model and Critique Examples

## Provide Students with Feedback

Providing Students With Feedback

## Have Students Engage in Peer Critique

Have Students Engage in Peer Critique

## Teaching Strategies

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## Activity: Integrate Teaching Strategy

- Work in Grade Level groups
- Select a teaching strategy to integrate in a lesson between now and the next workshop.
- On a large post-it, record the following:
  1. Question you will ask students
  2. Example CER - illustrate components (short)
  3. Teaching Strategy

## Share Teaching Strategies

- Read through the examples created by the different groups
- What teaching strategies intrigue you that you might consider using in your classroom?
- Other than time constraints, what do you think will be challenging about integrating the teaching strategies into your classroom?

## Classroom Talk

- Science is a way of knowing - writing, talking, doing, thinking and reasoning (Michaels et al, 2008).
- Scientific inquiry requires students to play an active role and engage in science talk (Duschl et al., 2006)
- Traditionally science classrooms have been dominated by teacher talk and in an IRE pattern (Crawford, 2005).
  - I = Initiate (Teacher)
  - R = Respond (Student)
  - E = Evaluate (Teacher)
- Creating a classroom culture around CER where it becomes part of the norms of classroom talk supports students in producing stronger science writing (McNeill, 2009).

## Classroom Talk - 5th Grade

Question:

How can you design a car to go the fastest?

**CLAIM**  
Circle ONE of the following.

- A. My car will go the fastest, because I will make it really strong.
- ☒ B. The car with the lightest load being pulled by the largest force will go the fastest.
- C. How fast a car goes is determined by how far it travels in a certain time.

**EVIDENCE**  
Circle TWO of the following.

- ☒ A. The car with only one block on the car took 1 second to travel across the table while the car with three blocks took 3 seconds.
- B. We always built our cars carefully and they traveled really fast.
- C. Car companies, like Ford, try to build light cars because they will travel faster.
- ☒ D. The car that was pulled by 5 washers took 2 seconds to travel across the table while the car with 1 washer took 7 seconds.
- E. Our group had a lot of fun building and testing our cars, except for the one day that our car kept breaking.
- F. Our experiments showed that light cars travel faster.

**REASONING**  
Circle ONE of the following.

- A. The data from our experiments shows us how to build our car. Since the data shows that fast cars have a light load and fast cars are pulled by a large force then this is how we should build our car.
- B. Since car companies and race cars have cars that are really light and have large engines this means we should design our car in the same way. It should have a light load and be pulled by a large force.
- ☒ C. The speed was determined by how many seconds it took for the car to travel across the table. The car with less blocks had a lighter load and it traveled faster. The car that was pulled by more washers was pulled by a greater force and it traveled faster.

## Classroom Talk - 5th Grade

### Activity: Analyze Classroom Talk



- Read the two examples of classroom talk
- Which discussion do you think would provide the students with more support to engage in CER writing?
  - Why? What are the characteristics of the discussion that make it different?
- What are some challenges in supporting students in science talk?
- What are some strategies to support students in science talk?

### Conclusions



- In the first workshop, we focused on introducing the framework, identifying places in your curriculum where it makes sense to include CER, and designing learning tasks.
- Today, we went the next step to discuss different teaching strategies and ways to include CER in your science talk to make it a part of your classroom culture.

### Logistics and Wrap-up



- Before you leave today
  - Hand in samples of student work
- Before March 30 Workshop
  - Read Chapters 3-4
  - Try another CER Learning Task with your students that incorporates a teaching strategy. Collect samples of student writing.
  - Bring 6 samples of student writing (2 stronger, 2 middle, 2 weaker)

### Contact information



- Workshop Webpage
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