Turn and Talk

What ideas did we have about where the heat might be coming from to drive convection in the mantle?

With your class



Matter, energy, and forces perspectives have helped us figure out earthquakes, volcanoes, and mantle convection.

How could each of these perspectives help us figure out where the heat might be coming from, deep inside Earth?

Slide C

Obtain Information



On your own

- Individually read your assigned article (Energy, Forces, or Matter).
- As you read, consider the relevant questions from our M-E-F triangle.
- When you finish reading, respond to the first 2 questions in the handout on your own. Be ready to discuss with your reading group.

Slide D

Make Sense of Information



- Be ready to share your responses with a new group in Round 2. You may want to take additional notes on this Round 1 conversation to prepare.
- In your new group, you will communicate ideas from your article to develop a cause-effect explanation that integrates ideas about matter, energy, and forces.



Exit Ticket

What questions do you have about the other two corners of the M-E-F triangle that would help to explain how a process at the subatomic scale can produce enough heat to drive convection?



Forces



Turn and Talk

Review your exit ticket questions.

How would answering these questions help us understand how radioactivity causes mantle convection?

Take a moment to bounce your ideas off your partner, and add any other questions you hope to answer before we move into Round 2 groups.

Communicate Information

Round 2 - With your Jigsaw group Each person gets up to 3 minutes to summarize the article they read in Round 1, and read the cause-effect questions and their answers aloud. With your Round 2 group, use the answers to these questions to fill out the

Cause-Effect Model handout.

→ Be ready to share your model with the class!

Use a Discussion Mapping Tool



Scientists Circle

Use the Discussion Mapping Tool to keep track of patterns in participation. What do we hope we will see?



Communicate Information



Scientists Circle

Come to consensus around a causeeffect model for explaining where the heat to drive convection comes from.

Keep track of ideas about matter by underlining them in red.
Keep track of ideas about energy by

Keep track of ideas about energy by underlining them in green.

•Keep track of ideas about **forces** by underlining them in purple.

Communicate Information



Scientists Circle

Where did you integrate ideas about the interactions between matter and energy?

Between matter and forces?

Between energy and forces?

Update Your Personal Glossary



Slide K

What new terms have we encountered or co-constructed a meaning for that we want to capture?

Personal Glossary

Debrief the Discussion Map

Left Starter of the second sec

With your class

What are some things we should consider during our discussions to make sure that everybody plays a role in moving our thinking forward? Slide M

Reflect on Scale

With your class



Where do the cause-effect mechanisms we identified today belong on our Scale Chart poster?



On your own

How did matter, energy, and forces help us make connections today between cause-effect mechanisms at vastly different scales of time and space?

class!

→ Be ready to share your ideas with the

Navigate: Radioactivity in the Afar Region

Turn and Talk

Based on our ideas, do you think we will find evidence of radioactive material in the Afar region? Why or why not? Slide O

Complete an Exit Ticket

On your own

Complete the Exit Ticket.

Teacher note: Provide a link to your copy of the Lesson 7 Electronic Exit Ticket either here or on a content management platform.

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