**PhET Tips for Teachers**   **Plate Tectonics**

Tips for controls:
- Try both tabs at the top of the simulation. The tabs are designed to help teachers scaffold lessons or make lessons age appropriate by using only one tab.
- **Rewind** allows the student to review a system that they have designed and keeps the motion setting (Divergent, Convergent or Transform)
- **New Crust** will reset, but the view settings will remain the same.
- **Reset All** will essentially start the tab from the initial state.
- This simulation uses a 3D library that may not run on all computers. If it does not open, updating your graphics drivers may solve the problem.
- In the Automatic mode, the "motion box" appears, but only possible options are displayed, so students might just see just "Convergent", but students in interviews were able to make sense after exploration.
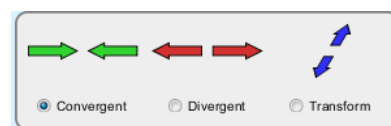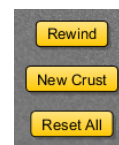
Important modeling notes / simplifications:

- Both the thermometer and density meters are meant to give enough information for general sense making; they are not designed for quantitative relationship determination.

- When the plates collide to make volcanoes, the temperature difference is measurable under the surface. The black image of the smoke coming out of the volcano is meant to help students visualize what is happening, but the temperature difference in the air is not measurable.
- Sometimes, when the young crust forms at the boundary, the label does not appear until a short time after so the labels don't overlap.
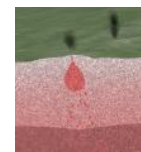
Insights into student use:
- Students observed in interviews achieved the desired learning goals (see **Plate Tectonics** and scroll down to "Sample Learning Goals) through open exploration of the sim. They found and used all the tools and plate motions.
- With Divergent motion, Young Crust is often formed. Some students may miss this; having them turn on the Labels ☑ Show Labels may help them.

Suggestions for sim use:
- For tips on using PhET sims with your students see: **Guidelines for Inquiry Contributions** and **Using PhET Sims**
- The simulations have been used successfully with homework, lectures, in-class activities, or lab activities. Use them for introduction to concepts, learning new concepts, reinforcement of concepts, as visual aids for interactive demonstrations, or with in-class clicker questions. To read more, see **Teaching Physics using PhET Simulations**
- For activities and lesson plans written by the PhET team and other teachers, see: **Teacher Ideas & Activities**