





Unit 2 Calendar: Energy, Forces and The Earth's Crust In this unit, we will look more closely at one of Earth's systems: the geosphere. We will consider the energy flow through this system through convection and motion, and get stuck on the distinction between energy that is transferring very slowly over millions of years, and sudden energy transfers like earthquakes. To explain these sudden transfers of energy, we will need to develop a new framework for understanding why energy transfers: balanced and unbalanced forces. We will model various plate interactions using force diagrams, and consider the value of using energy and forces to describe interactions.



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# Hour 1

- 1. Henry, Komal, Jaeden, Oleg
  2. Joseph, Johnny, Marissa
  - 3. Evan, Clare, Max, Julia
  - 4. Charlie, Kian, Aaron M
  - 5. Aniyah, Adian, Cameron
  - 6. Brandon, Blake, Lataysia
  - 7. Tristan, Kevin, Shawnna, Addie
  - 8. Jordyn, Jay, Bale



## Hour 2

- 1. Melanie, Cameron M, Marisa, Marco
- 2. Anaiya, Carly, Nehemiah, Corwin
- 3. Omari, Daniel, Bryce
- 🦻 4. Yeabi, Za'Mariyah, Frida
  - 5. Joseph, Ally, Mikayla, Kieran
  - 6. Cooper, Jennifer, Katie T
  - 7. Cameron S, Lundy, Euna
  - 8. Justin, Vicky, Jessie, Katie S

### Monday

- Wrap Up Documentary
- Grade Check In
- Project Work Time
- Pass Back Papers and Grade Meetings
- Tuesday and Wednesday- Stress and Strain,
  - Newton's Laws and Energy Transformations
  - Thursday and Friday- Project Work Time Monday and Tuesday- Gallery Walk Presentations

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#### What we noticed

- Land is coming from under the ocean
- Land moves a lot
- Terastic- looked like a swirl
- Shifted terrain types several times
- Different periods changed differently
- Change in geography
- How life evolved over time
- Auburn Hills get closer and farther from equator
- Water would go over land and then come back
- Mammals didn't used to exist until 90 million years ago

### What we want to know

- What is the future going to look like?
- Why it slowed down and sped up
- Does this happen on other planets?
- Why do the glaciers come and go?
- What caused these plates to move?
- How to find out how fast its moving
- How accurate is all of this information
- Why does evolution take so long?





#### What we noticed

- Auburn hills got closer to the equator and then went back
- All the continents are connected way back
- Ice and dirt than green with land spreading out all over
- AH was once under water
- As time went on, more deserts
- Multiple mass extinction events
- Further back we went, below sea level
- When there was more glaciers, more water than land

### What we want to know

- If we didn't have ice ages, would we still have glaciers?
- Where are the tectonic plates in the past?
- What speed do the plates move at?
- What st causing the atmosphere to deteriorate? How?
- Why are the land masses so much more fractured (seperated)?
- How periods of time get their names?
- Why we crossed the equator?
- Are the continents still moving now?
- Is AH going to be the north pole?



Warm Up

- Why would it be important to study the movement of the Earth's plates over time? Why is that important for the future?
  - Agenda

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- Warm Up
- Hour 2- Class Consensus
- Discovering Plate Boundaries Day 1- PUZZLE!
- Grade Check in's Monday start of class

No phones or computers today!





Warm Up

Why would it be important to study the
 movement of the Earth's plates over time?
 Why is that important for the future?

Agenda

00

- Warm Up
- Hour 2- Class Consensus
- Discovering Plate Boundaries Day 1discovering maps



### Warm Up

Take out your Part 1 Information for the Dream Vacation Project from yesterday

- Agenda
  - Dream Vacation Project Share Out
  - Intro to Motion Vocab
  - Work Time





- 10 meters
- 13 m/s south
- 25 mph
  - 15 kg

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- -15 Newtons
- 26 buckets
- 33 m/s 30 degrees southwest
- 3 miles north
- 22 cm up
  - + 100 million miles





Scalar Vs. Vector







• You walk 3 miles north and 2.5 miles south in 1.5 hours.

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• What is your distance?

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- Displacement?
- Speed?

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Velocity?



• What is the total distance the person traveled in the situation?

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- How much time did it take them to complete this?
- What is the displacement from start to finish?
- What is the speed in yards per minute?

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What is the velocity in yards per minute?



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- What is the distance traveled from A to C? Displacement?
- If the average speed is 2 meters per second, how long did it take them to walk all the way around the path?

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Currently New York and London are moving apart from the Eurasia and North
 American Plates. Over 100 years, they move 200 cm apart.

- What is the speed that they are moving apart?
- Over 1,000,000 years, how many centimeters are they apart? In miles?
- Is the distance and displacement same in this situation? Why or why not?
- What direction is the Eurasia plate moving?

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### Stress and Strain

Opening Question: How do we use stress and strain in everyday life? Review: What makes a great model? Exploration 1: Sugar Cube and Books

- 1. Model the situation
- 2. Predict with group how many books it will take will break it
- 3. Perform with class
- 4. Now drop books on it from the same height. How does the number of books change?

**Exploration 2: Silly Putty** 

- 1. Flatten out silly putty in the palm of your hand. Hold it on the sides like a video game controller.
- 2. Pull at a medium pace. Model what happens
- 3. Pull quickly. Model what happens.
- 4. Separate the silly putty into 2 sections
- 5. Slowly move them together. Model what happens.
- 6. Quickly move them together. Model what happens? Wrap Up Questions
  - 1. How do these show stress and strain?
  - 2. How can this relate to our plates moving?
  - 3. What types of plates do these represent? Write on your model













LAW #1

LAW #2

LAW #3

#### Newton's laws of motion in physics

A body at rest will remain at rest, and a body in motion will remain in motion unless it is acted upon by an external force.

The force acting on an object is equal to the mass of that object times its acceleration, F = ma.

For every action, there is an equal and opposite reaction.













Reflection on Communication Rubric (most recent one)... On Google Classroom

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Rate yourself based on this small group presentation 1-4 and WHY (no 0.5s). Use examples.

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# Newton's Laws Mind Map

- Must have a branch of each of Newton's Laws
- Must include each of newton's Laws, a definition in your own words, examples, demos, diagrams, etc.
- It can have unlimited number of branches
- You can make it by hand, Docs, Canva, Slides, etc.
- Examples of next slide

















# Episode 1

Swears at beginning (live footage), nudity at 13:00 (skip section leading up to this with the Israeli tourists)

# Episode 2

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Swears at beginning (live footage), Swears at 29:30 (skip 27-30)





# Episode 3









# How could we prepare better for Earthquakes similar to the Nepal Earthquake?







#### The Hawaiian Islands



The sites of islands, seamounts, and guyots produced by the Hawaiian Hot Spot and the moving Pacific plate.







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