

Transformations CHALK TALKS

1. What is energy?
2. What are some of the different forms of energy?
3. How do the different forms of energy change?
4. What is matter?
5. What are the different states of matter?
6. What are examples of how matter can be changed?

Transformations SEE-THINK-WONDER

SEE - Key Ideas	THINK - Examples	WONDER - Questions
Resource: <u>Cosmos</u> (episode 6)		
- We are made of atoms - When two or more atoms combine, they create a new <u>MOLECULE</u>	- There are more atoms in your eye than stars in all of the galaxies in the known universe - Humans are made of BILLIONS and BILLIONS and BILLIONS of atoms - Every molecule of water is composed of two tiny hydrogen atoms attached to one large oxygen atom	- Jiho: I wonder if other atoms or molecules can be bigger or smaller than others? - Valentina Livore: I wonder, do we all have the same quantity of atoms? - Grant: I wonder what are atoms made of?

- What makes something a <u>LIQUID</u>? - <u>TEMPERATURE</u> is an increase in energy - What is <u>EVAPORATION</u>?	(H₂O) - If it is not too hot or not too cold, water molecules can move and slide past each other - The sun warms the water molecules, and with more <u>energy</u>, the molecules move faster - An increase in temperature causes the water molecules to move fast enough to <u>break free</u> from their neighbors	
---	--	--

- What is
CONDENSATION?

- TARDIGRADES can be found in a dew drop, they are smaller than a head of a pin!

- Plants make food out of sunlight
(PHOTOSYNTHESIS)

- A dew drop! When the water vapor (GAS) cools down enough to turn back into a water molecule

- Tardigrades have been living on Earth longer than humans (about 500 million years!)

- For every human, there is a billion tardigrades!

- Tardigrades can live anywhere on Earth

- **Madalena:** How can a tardigrade die without getting eaten?

- CHLOROPHYLL is the molecule that transforms sunlight into energy

- SUGAR MOLECULES store solar energy

Resource: Bill Nye Energy

- Energy is everywhere! (Just like matter!)

- Energy = WORK

- Heat energy, sound energy, light energy, muscle energy, falling things have energy, electrical energy (electricity)

- Energy makes things happen!

- **Tom:** I think that energy can change by the temperature, but can it change by hitting an object?

- **Gabi:** I wonder if there is energy in stuff that doesn't move or live?

- Energy can transform to one form to another

- Flowing water can transform into electrical energy
- Burning fuel transforms to electrical energy
- Nuclear energy comes from atoms; if atoms come together, they get hot and produce steam, and then it transforms into electrical energy
- Electricity can also transform into movement, sound, light and electrical energy

- **Nico:** I wonder what happens when you completely run out of energy?
- **Sarah:** Do humans have energy? (What different forms of energy to humans have?)
- **Felipe:** Why is potential energy always greater than kinetic energy?
- **Sofia L:** I wonder how people can transform water into energy?

- <u>POTENTIAL ENERGY</u> - <u>KINETIC ENERGY</u> - Potential energy can transform into kinetic energy - Chemical energy transforms into kinetic energy	- Energy that is <u>stored</u>; it has the potential to do something - Energy that is <u>moving</u>	- Ana Claudia: I wonder if there is something that is neither potential energy nor kinetic energy?
Resource: Matter and Energy (Foss Science Textbook)		
- Energy sources	- Energy makes things happen - The sun provides energy - Energy is everywhere	

- Fuel

- Fuel is energy
- Fuel stores energy
- Natural gas is also a kind of fuel
- People burn fuel to release the stored energy
- The heat energy can be used to warm homes and make electricity
- Oil, gasoline and wood are fuel

- Food

- Food is a fuel that makes life happen
- Animals convert food into motion and heat
- Food is the fuel that provides energy for

- Chemical Energy - Batteries	people; it is digested and the stored energy is released - Food energy comes from the sun - Leaves absorb light energy - Sugar has chemical energy - Batteries are a source of stored energy - Electricity can make light, sound and movement	
---	--	--

Resource: [Bill Nye Matter](#)

- The universe is made of matter
- Matter comes in 3 phases
- Energy transforms a phase into another kind of phase
- To change liquid to a gas, you ADD energy
- To change a liquid to a solid, you TAKE AWAY energy

- Anything you can touch is made of matter
- The 3 phases of matter are solid, liquid and gas
- For example, when you heat water (add energy), it turns into water vapor

- **Jiho:** I wonder what phase is JELLO?

- Pressure is moving molecules

- Absolute zero can NEVER be reached because energy is constantly moving in our world

- The greater pressure, the faster the molecules are moving

- A decrease in pressure means the molecules are moving slower