**Lesson 5 – Rate of Change**

THE FOLLOWING **VIDEO** HAS BEEN APPROVED FOR
ALL AUDIENCES
BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA , INC

THE VIDEO HAS BEEN RATED

I   INTELIGENT

UNDER 15 REQUIRES TEACHER ASSISTANCE

STRONG EARTH SCIENCE LANGUAGE , DETAILED DIAGRAMS , AND SUPER AWESOMENESS

- I can identify the dependent & independent variables

- I can describe a cyclic change

- I can use the rate of change formula

- Independent variable goes on the x-axis (bottom/ horizontal)

- Dependent variable goes on the y-axis (left/vertical).
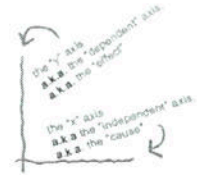
- I can identify the dependent & independent variables

- I can describe a cyclic change

- I can use the rate of change formula

Cyclic Change

- Occur in some orderly fashion in which events constantly **REPEAT & PREDICTABLE**
  EXAMPLE:
  - Movement of Celestial Objects
  - # of Sunspots
  - Tides & Seasonal Events

- I can identify the dependent & independent variables

- I can describe a cyclic change

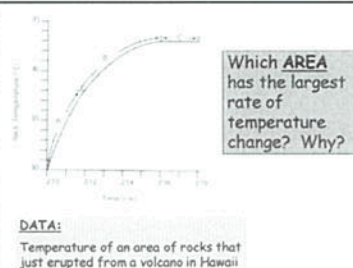- I can use the rate of change formula

---

Rate of Change

- How MUCH a FIELD is altered over a given time
- Changes can be very FAST others very SLOW

EXAMPLE:

- Lightning FLASH is a fraction of a second
- Wearing down of mountain can take millions of years

Which **AREA** has the largest rate of temperature change? Why?

DATA:
Temperature of an area of rocks that just erupted from a volcano in Hawaii

---

Measuring Rate of Change

Rate of change = $\dfrac{\text{Change in field value}}{\text{Change in time}}$

Found Front Page of ESRT

Slide 1

- I can identify the dependent & independent variables

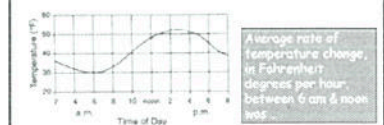- I can describe a cyclic change

- I can use the rate of change formula

Slide 2

Time (PM)	Rock Temperature (°C)
2:10	30
2:11	33
2:12	38
2:13	40
2:14	41
2:15	42
2:16	41
2:17	41
2:18	41

$$R.O.C. = \frac{40°C - 30°C}{2:13\ PM - 2:10\ PM}$$

$$R.O.C. = \frac{10°C}{3\ min}$$

$$R.O.C. = 3.3°C/min$$

Based on **DATA TABLE** what is the rate of change in rock temperature from 2:10 PM to 2:13 PM?

Slide 3

Average rate of temperature change, in Fahrenheit degrees per hour, between 6 am & noon was ...

$$R.O.C. = \frac{48°F - 30°F}{12:00\ pm - 6:00\ am}$$

$$R.O.C. = \frac{18°F}{6\ hr} = 3°F/hr$$

Slide 4

- I can identify the dependent & independent variables

- I can describe a cyclic change

- I can use the rate of change formula