

## Fragile system

Consider the following three phenomena:

- 1) a flood caused by a thunderstorm
- 2) a storm surge caused by a hurricane
- 3) a tsunami caused by an underwater earthquake

These are ALL directly associated with \_\_\_\_\_.

Student Response	Correct Answer
A. solar energy	
B. geothermal energy	
C. storms	
D. shorter return periods for more-intense phenomena	
<input checked="" type="checkbox"/> E. both the concentration and dilution of energy	<input checked="" type="checkbox"/>

Score: 1/1

The count of all protons and neutrons in the nucleus of an atom is called the \_\_\_\_\_.

Student Response	Correct Answer
A. atomic number	
<input checked="" type="checkbox"/> B. atomic mass number	<input checked="" type="checkbox"/>
C. Avogadro's number	
D. covalence	
E. gluon number	

Score: 1/1

The three greatest chemical elemental components of the Earth's crust are \_\_\_\_\_.

Student Response	Correct Answer
A. nitrogen, oxygen, hydrogen	
<input checked="" type="checkbox"/> B. oxygen, silicon, aluminum	<input checked="" type="checkbox"/>
C. silicon, iron, calcium	
D. aluminum, carbon, sodium	
E. silicon, magnesium, iron	

Score: 1/1

Which statement is FALSE?

Student Response	Correct Answer
A. Human society is more fragile to natural disasters than the planet Earth.	
B. Over the past 100 years, the number of fatalities from natural disasters has increased.	
<input checked="" type="checkbox"/> C. With improved technology and warning systems, natural disasters can be prevented.	<input checked="" type="checkbox"/>
D. Infrastructures built by man for communication, transportation, and utilities are more fragile to natural disasters than the planet Earth.	
E. Natural disasters are normal components of Earth's evolution.	

Score: 1/1

Given the graph below. For a magnitude 7 earthquake, the return period (days) is roughly \_\_\_\_\_.

Student Response	Correct Answer
A. 0.5	
B. 7	
C. 10	
<input checked="" type="checkbox"/> D. 36	<input checked="" type="checkbox"/>
E. 52	

Score: 1/1

The most common element in the Earth's crust is \_\_\_\_\_.

Student Response	Correct Answer
<input checked="" type="checkbox"/> A. oxygen	<input checked="" type="checkbox"/>
B. silicon	
C. iron	
D. nitrogen	
E. hydrogen	

Score: 1/1

When you raise an object twice as high, the potential energy increases by a factor of \_\_\_\_\_.

Student Response	Correct Answer
A. a half	
B. one	
<input checked="" type="checkbox"/> C. two	<input checked="" type="checkbox"/>
D. four	
E. an order of magnitude	
Score: 1/1	

Which type of energy depends on an object's velocity?

Student Response	Correct Answer
<input checked="" type="checkbox"/> A. kinetic energy	<input checked="" type="checkbox"/>
B. latent heat	
C. sensible heat	
D. potential energy	
E. work	
Score: 1/1	

In developed countries \_\_\_\_\_ will be increasingly destroyed due to natural hazards.

Student Response	Correct Answer
<input checked="" type="checkbox"/> A. lives	
B. farm animals	
C. money	
D. infrastructure	<input checked="" type="checkbox"/>
E. property	
Score: 0/1	

"Order of magnitude" means:

Student Response	Correct Answer
A. binary	
B. hexadecimal	

- ☒ C. power of ten  
D. power of two  
E. roughly



Score: 1/1

For most disaster scales, a disaster of magnitude 6 has \_\_\_\_\_ times greater energy than a disaster of magnitude 2.

**Student Response**

**Correct Answer**

- A. 3  
B. 4  
C. 5  
☒ D. 10,000  
E. 1,000,000



Score: 1/1

During one year of measurement, 10 tornadoes of category 5 on the Fujita scale were observed. The corresponding return period in days is about \_\_\_\_\_.

**Student Response**

**Correct Answer**

- A. 5  
B. 10  
☒ C. 36  
D. 50  
E. 365



Score: 1/1

Which is TRUE?

**Student Response**

**Correct Answer**

- A. As disaster prediction improves, property and infrastructure losses will generally decrease.  
B. In developed countries, fatalities due to natural disasters are increasing despite more accurate and timely warnings.  
C. When infrastructure is disrupted by natural disasters, the functionality of human society is rarely affected.

☒ D. Damage and loss of life from natural disasters can be minimized. 

E. Natural processes become hazards only near large population centres with fragile infrastructure.

Score: 1/1

The graph below shows the approximate population of humans on earth for years 1960 and 2000. Over most of the evolution of earth's population, population has grown exponentially. Considering only the EXPONENTIAL projection shown in this graph, you would expect the population (in billions) at year 2040 to be roughly \_\_\_\_\_.

**Student Response**

**Correct Answer**

A. 14

B. 9

C. 8

D. 10.5

☒ E. 12



Score: 1/1


Which statement is TRUE?

**Student Response**

**Correct Answer**

A. The maximum population that can be carried by the earth is fixed.

B. The survivability rate of people in natural disasters will increase as population grows, due to better social networks.

☒ C. Population is self-limiting. Namely, the death rate increases when the carrying capacity is exceeded. 

D. Earth's carrying capacity increases as more people occupy our planet.

E. You have almost no control over your own chances of surviving a natural disaster.

Score: 1/1