

Evolution

1. Evolution

No - what do you want kids to know about evolution? This is a topic and does not say what you want them to know or understand.

Long distance runners have more mitochondria than non-athletes.

2. Long distance runners have more mitochondria than non-athletes.

Phenomenon. Observable/accessible. Makes you wonder/ask why? Connects to an important science idea.

Organisms interact with their environments and other organisms.

3. Organisms interact with their environments and other organisms.

No - concept

When wolves were reintroduced to Yellowstone in 1995, they had a number of different effects on the ecosystem.

4. When wolves were reintroduced to Yellowstone in 1995, they had a number of different effects on the ecosystem.

Phenomenon. Makes me wonder about the effects & causal mechanism.

The Irish potato famine showed why asexual reproduction can be problematic.

5. The Irish potato famine showed why asexual reproduction can be problematic.

No - this is something that can be explained pretty easily in a short time period and does not involve multiple concepts. It is not complex enough to be a phenomenon for MS LS.

Chloroplasts contain chlorophyll,
which causes plants to appear
green. Other pigments cause other
colors.

6. Chloroplasts contain chlorophyll, which causes plants to appear green. Other pigments cause other colors.

No - not complex, not generalizable, and it would not take much time to learn. Implies the causal mechanism.

There are fewer carnivores than herbivores and fewer herbivores than producers in a food web.

7. There are fewer carnivores than herbivores and fewer herbivores than producers in a food web.

Phenomenon. Might be more interesting if it were more specific. Makes me wonder about THIS pattern.

A person from the coast is breathing hard and has a fast heart rate while hiking in the mountains of Colorado.

8. A person from the coast is breathing hard and has a fast heart rate while hiking in the mountains of Colorado.

Phenomenon. Wonder why!

Some important parts of the circulatory system are the heart, blood vessels, and blood while some important parts of the respiratory system are the lungs, bronchi, and alveoli.

9. Some important parts of the circulatory system are the heart, blood vessels, and blood while some important parts of the respiratory system are the lungs, bronchi, and alveoli.

No (does not involve multiple dimensions or concepts that students have to link); just information

Cells have parts, called organelles,
that carry out specific functions to
help the cells work properly within
the body.

10. Cells have parts, called organelles, that carry out specific functions to help the cells work properly within the body.

No - concept; no real link to causal mechanisms or wondering why...nothing to figure out.

Two parents with A type blood
wonder why their child has O type
blood.

11. Two parents with A type blood wonder why their child has O type blood.

Phenomenon; goes beyond a single lesson; makes me wonder why

A drought in the Galapagos led to birds that had larger beaks than those in generations before.

12. A drought in the Galapagos led to birds that had larger beaks than those in generations before.

Phenomenon

Jaguars can be black or spotted.

13. Jaguars can be black or spotted.

No (could be phenomenon, but I feel like it is not specific enough about the context, why this happens is pretty easily searchable online, and students do not necessarily have to link many ideas to explain the it); not enough of a puzzle; not compelling enough.

A 10-year-old has been having diarrhea, fatigue, and anemia.

14. A 10-year-old has been having diarrhea, fatigue, and anemia.

Phenomenon; Relatable & observable; wonder why

The immune system has several lines of defense that interact with other body systems to protect the body.

15. The immune system has several lines of defense that interact with other body systems to protect the body.

No - concept; could be turned into a phenomenon

The life expectancy of people with cystic fibrosis has increased greatly over the last twenty years.

16. The life expectancy of people with cystic fibrosis has increased greatly over the last twenty years.

DISCUSSION STATEMENT

This one very much depends on the context. Could be a “no” because it is more of a fact. Could be a phenomenon because it is something that students could use data to explain and link a number of concepts. Phenomena; could be surrounded by data/readings; multiple causal mechanisms.

All muscle cells contain
mitochondria.

17. All muscle cells contain mitochondria.

DISCUSSION STATEMENT

No, because it is too narrow, does not require understanding of multiple concepts. But, could be presented as a phenomenon if is done so that students are comparing mitochondria in muscle cells compared to other kinds of cells and explaining why there would be differences.

If a person uses more energy than they take in, they lose weight.

18. If a person uses more energy than they take in, they lose weight.

DISCUSSION STATEMENT

Phenomenon because it is relevant to lives, data that students can study, complex ideas about using and taking in energy. But, could be presented as a simple fact or math problem in which case it would not be a phenomenon.; GIVES us too much...what's to figure out?

Pilobolus is a fungus that is less than 1 cm tall and can shoot a spore 2 meters. This involves acceleration from 0 to 20 km/h in only 2 μ s, subjecting it to over 20 000 G, equivalent to a human being launched at 100 times the speed of sound.

19. Pilobolus is a fungus that is less than 1 cm tall and can shoot a spore 2 meters. This involves acceleration from 0 to 20 km/h in only 2 μ s, subjecting it to over 20 000 G, equivalent to a human being launched at 100 times the speed of sound.

DISCUSSION STATEMENT

No - what are you trying to explain? Although this is interesting--which is what participants may be basing their ideas about phenomena on at this point--there is not anything that you need to explain based on the statement that is there. It could easily be changed to make it more about how shooting the spore represents a reproductive strategy and then it would be more phenomenon-like.

The circulatory and respiratory systems work together to provide the body with oxygen and remove waste.

20. The circulatory and respiratory systems work together to provide the body with oxygen and remove waste.

No - concept

A pond in a community has unexpectedly turned green and it is affecting tourism in the area.

21. A pond in a community has unexpectedly turned green and it is affecting tourism in the area.

Phenomenon

A small change in a DNA sequence
can lead to a life threatening
disease.

22. A small change in a DNA sequence can lead to a life threatening disease.

No - concept. It's telling us a "weak" causal mechanism; could be better presented better.

Neighboring farmers disagree about whether a certain type of seed or breeding specific plants will lead to tomatoes that stay fresh longer.

23. Neighboring farmers disagree about whether a certain type of seed or breeding specific plants will lead to tomatoes that stay fresh longer.

Phenomenon

Male peacock spiders have colorful backs and perform a dance in a way that makes them unlike any other animal in the world.

24. Male peacock spiders have colorful backs and perform a dance in a way that makes them unlike any other animal in the world.

Phenomenon