

## Sweaty T-Shirts and Human Mate Choice

Type the following URL into your browser:

[http://www.pbs.org/wgbh/evolution/library/01/6/l\\_016\\_08.html](http://www.pbs.org/wgbh/evolution/library/01/6/l_016_08.html)

Click on either “Quicktime” or “RealPlayer,” depending on the software you have.

This video lasts 3 minutes and 11 seconds.

As students watch the video clip, they should answer the following questions.

1. What do evolutionary psychologists study?
2. People tend to respond to things the same way. Do you agree or disagree? Provide evidence for your answer.
3. Why do evolutionary psychologists think this is so?
4. Explain the sweaty t-shirt experiment.
5. To which t-shirts did females respond most favorably?
6. Why does this make evolutionary sense?

### **Answers**

1. What do evolutionary psychologists study?  
How human evolutionary history affects the way we think today.
2. People tend to respond to many things the same way. Do you agree or disagree? Provide evidence for your answer.  
Accept all reasonable answers.
3. Why do evolutionary psychologists think this is so?  
All are legacies of our evolutionary past. Things that smell bad to humans might indicate contamination, which is bad.
4. Explain the sweaty t-shirt experiment.  
Young men slept in the same t-shirt for several nights then women smelled them and chose their favorite.
5. To which t-shirts did females respond most favorably?  
It turned out that women rated higher the t-shirts of men whose immune genes were unlike their own.
6. Why does this make evolutionary sense?  
Different immune genes give offspring greater protection against viruses and other pathogens.

## **A Mutation Story**

Type the following URL into your browser:

[http://www.pbs.org/wgbh/evolution/library/01/2/1\\_012\\_02.html](http://www.pbs.org/wgbh/evolution/library/01/2/1_012_02.html)

Click on either “Quicktime” or “RealPlayer,” depending on the software you have.

This video lasts 4 minutes and 50 seconds.

As students watch the video clip, they should answer the following questions.

1. What causes malaria?
2. How are humans infected?
3. What part of the body does the parasite attack? Why are these cells important?
4. What happens to infected cells?
5. Why is malaria not fatal to many Africans?
6. What happens if a child inherits two copies of the sickle cell gene?
7. Why is getting only one copy of the sickle cell good?
8. What is a positive consequence of the sickle cell gene? What is a negative consequence?

## **Answers**

1. What causes malaria?  
A parasite carried by mosquitoes causes it.
2. How are humans infected?  
They’re infected through a mosquito’s bite.
3. What part of the body does the parasite attack? Why are these cells important?  
Red blood cells; they carry oxygen throughout the body
4. What happens to infected cells?  
When the parasite multiplies enough, the cell bursts.
5. Why is malaria not fatal to many Africans?  
Many Africans are resistant to the disease because they have a mutation that changes the shape of the hemoglobin molecules so that they cannot be infected by the malaria parasite.
6. What happens if a child inherits two copies of the sickle cell gene?  
All of his/her hemoglobin has the mutation.
7. Why is getting only one copy of the sickle cell good?  
Only about half of the blood cells are sickle-shaped, conferring some resistance to malaria.
8. What is a positive consequence of the sickle cell gene? What is a negative consequence?  
Protection from malaria; if you get two copies of the gene, all of your hemoglobin has the mutation and you can’t get enough oxygen and your blood cells can get stuck in blood vessels.

## **Did Humans Evolve?**

Type the following URL into your browser:

<http://www.pbs.org/wgbh/evolution/educators/teachstuds/svideos.html>

Click on “Video 5: Did Humans Evolve?”

This video lasts 5 minutes and 34 seconds.

As students watch the video clip, they should answer the following questions.

1. What is the difference between a relative and an ancestor?
2. Is it correct to say that humans came from apes? Why or why not?
3. Genetically, are humans and apes very similar or very dissimilar?
4. What is the benefit of comparing the DNA of different species?
5. What is a mutation?
6. Why must you use the same sequences in the same gene if you’re comparing two species?
7. Is human DNA more similar to chimp DNA or rat DNA? What does this tell us about our common ancestor with each of these organisms?
8. What are three pieces of evidence that indicate that humans and apes share a common ancestor?
9. Do you think our as our common ancestor was human-like, ape-like, or a little of both? How would you define the term “common ancestor?”

## **Answers**

1. What is the difference between a relative and an ancestor?  
A relative is someone you directly descended from while an ancestor is someone who lived generations before you.
2. Is it correct to say that humans came from apes? Why or why not?  
No because we share a common ancestor.
3. Genetically, are humans and apes very similar or very dissimilar? How do we know?  
Similar. We’ve compared our DNA and it is very much alike.
4. What is the benefit of comparing the DNA of different species?  
We can establish how closely related they are.
5. What is a mutation?  
A mistake in copying DNA sequences.
6. Why must you use the same sequences in the same gene if you’re comparing two species?  
Otherwise it’s an invalid comparison.
7. Is human DNA more similar to chimp DNA or rat DNA? What does this tell us about our common ancestor with each of these organisms?  
Chimp. We share a more recent common ancestor with chimps than rats.
8. What are three pieces of evidence that indicate that humans and apes share a common ancestor?

Fossil record, physical features, and molecular evidence

9. Do you think our as our common ancestor was human-like, ape-like, or a little of both? How would you define the term “common ancestor?”

A little of both. A common ancestor has some characteristics of all of the organisms that descended from it.

## **Why Does Evolution Matter Now?**

Type the following URL into your browser:

<http://www.pbs.org/wgbh/evolution/educators/teachstuds/svideos.html>

Click on “Video 6: Why Does Evolution Matter Now?”

This video lasts 6 minutes and 19 seconds.

As students watch the video clip, they should answer the following questions.

1. What is a microbe?
2. How do humans play a role in microbe evolution?
3. What kind of microbe causes tuberculosis (TB)?
4. How is it spread? Why is this so dangerous?
5. What are some symptoms of TB?
6. What is multi-drug resistant TB?
7. How is TB usually treated?
8. What happens if a patient does not take all prescribed antibiotics? What kind of bacteria does this leave?
9. What does this have to do with natural selection?
10. How do antibiotics contribute to the evolution of pathogens such as TB?

## **Answers**

1. What is a microbe?  
Small particles that cause disease; bacteria, viruses, mycobacteria, and fungi
2. How do humans play a role in microbe evolution?  
The way we use antibiotics influences what microbes survive
3. What kind of microbe causes tuberculosis (TB)?  
A bacterium
4. How is it spread? Why is this so dangerous?  
By coughing; it can be transmitted through the air and infect many people
5. What are some symptoms of TB?  
Coughing, fever, weight loss,
6. What is multi-drug resistant TB?  
A form of TB that does not respond to regular medications
7. How is TB usually treated?  
By administering several types of antibiotics to kill all the bacteria
8. What happens if a patient does not take all prescribed antibiotics? What kind of bacteria does this leave?  
Resistant bacteria are left and they multiply, passing on their resistance to the drug on to their offspring.

9. What does this have to do with natural selection?

This means that the resistant bacteria are selected and will continue to evolve. Non-resistant ones were not selected for and will die off.

10. How do antibiotics contribute to the evolution of pathogens such as TB?

Certain bacteria are susceptible to antibiotics while others are to a lesser degree or not at all. Misuse of antibiotics has the potential to create strains of bacteria that do not respond to treatment.