

Antibiotic Resistance

Length: 20 minutes

Materials: Worksheet #2 printed for each student, computer and projector for Powerpoint slides and optional video.

PowerPoint Slides: If using the prepared slide deck, this section will go through slides 11-27

- Why is it important to use antibiotics correctly? Improper use of antibiotics can lead to **antibiotic resistant bacteria (i.e. superbugs)**. Ask students if they know what this means.
- Review how antibiotic resistance develops: Bacteria are always randomly mutating. Sometimes, they will randomly develop a mutation that makes them resistant to antibiotics. Normally, the helpful (or good) bacteria in our body take up space and prevent the few resistant bacteria from taking over. When we overuse antibiotics, we kill the helpful (or good) bacteria. The resistant bacteria survive and have lots of space to multiply and grow. This is **natural selection**.
- Discuss how antibiotics are needed for modern medicine – surgery, childbirth, transplants, burn therapy, cancer treatments (and most modern medicine) relies on antibiotics to treat or prevent infections. Before antibiotics existed, people could die even from infected cuts and scrapes.
- When antibiotics are used too much or incorrectly (for example if they were used for treating viral infections), bacteria causing you to be sick may no longer respond to the drug and you may continue to be sick. *“To preserve antibiotics for the future, it’s our job to limit our use of antibiotics, to make sure we are using them for the right reason, so that they work when we really need them.”*

- Have students get in small groups to work on **Worksheet #2** (page 7).
- Review **Worksheet #2** with the class using Answer Key #2 on **page 8**. Emphasize that although every time we use antibiotics there is a risk of bacteria developing resistance, we want to combat this by using antibiotics **correctly and for the right reason**, not avoiding them entirely, because antibiotics can be helpful and even life-saving in many situations.
- Ask students how we can prevent antibiotic resistance. Use the following prompt: *“If you were at the doctors’ office, what questions could you ask to make sure you’re using antibiotics correctly?”* (Do I have a bacterial infection or a viral infection? Do I need antibiotics? How long do I need to take these antibiotics for?)

Optional Video “Antibiotic Resistance and the Rise of Superbugs” (7:23 mins)



<https://www.youtube.com/watch?v=fyRyZ1zKtyA> (watch until 6:45)

Terry's Antibiotic Dilemma

Terry is feeling sick. He found some antibiotics in his medicine cabinet. What could happen if:

	Terry took the antibiotics, and his illness was caused by a virus	Terry took the antibiotics, and his illness was caused by a bacteria	Terry went to the doctor and was prescribed antibiotics
Would Terry feel better?			
What would happen to the good bacteria in his body?			
Is there a chance of resistance developing?			
Should Terry take the antibiotics?			

Terry's Antibiotic Dilemma

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	Terry took the antibiotics and his illness was caused by a virus	Terry took the antibiotics and his illness was caused by a bacteria	Terry went to the doctor and was prescribed antibiotics
Would Terry feel better?	No, because the antibiotics will not kill the virus	Most likely not. The antibiotics may or may not work against the specific bacteria he is infected with, and they could be expired.	Yes
What would happen to the good bacteria in his body?	Some of the good bacteria in his body would die.	Some of the good bacteria in his body would die.	Some of the good bacteria in his body would die.
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p><i>This is why a common side effect of antibiotics is an upset stomach (remember, good bacteria help with digestion). However, if he takes antibiotics correctly and only as long as prescribed by his doctor, his good bacteria will have a chance to bounce back.</i></p> </div>			
Is there a chance of resistance developing?	Yes – when good bacteria die, resistant bacteria can take over	Yes	Yes
Should Terry take the antibiotics?	No – they will not help with his illness and may cause resistance to develop.	No – they may not be the correct antibiotics for his illness. Some bacterial infections don't even need antibiotics because they get better on their own. Don't use old antibiotics!	Yes – even though there is a small chance of resistance, we want to use antibiotics when we need them so that illnesses don't spread or get worse.