

# HOW GERMS SPREAD

## FRAMEWORK

I. Scientific and Engineering Practices

II. Cross-Cutting Concepts

III. Physical Sciences

## SKILLS/OBJECTIVES

- Learn how diseases spread, and basic means to prevent/slow down their spread.

## MATERIALS

- Germ-glow
- A supply of water (if there is a sink in the room, this will work.)
- Paper towels
- Liquid soap
- Boundary marker
  - *NOTE: Just something to demarcate a zone on the floor. Can be masking tape, string, etc.*
- Tokens
  - *NOTE: something small that isn't edible and isn't bouncy.*
- Bacteria petri dishes from previous lesson

## NOTES

N/A

## BACKGROUND

- Bacteria can grow in petri dishes
- Bacteria is everywhere, but you can't always see it because due to its very small size – that's why we have microscopes, which can help to get a better picture of the bacteria.

Activity # 1	<b>Petri Dishes</b>
Materials	<ul style="list-style-type: none"> <li>• Petri dishes</li> </ul>
Worksheet	N

- Ask students what they did last time, and remind them of details as needed.
- Ask students to describe what they're looking at, and to compare it to what it looked like before

Activity # 2	<b>How to get rid of germs</b>
Materials	<ul style="list-style-type: none"> <li>• Germ glow</li> <li>• Supply of water</li> <li>• Paper towels</li> <li>• Soap</li> </ul>
Worksheet	N

- Each kid puts the germ glow on their hands.
- Explain that the substance is showing all of the germs on your hands. If you can get the substance off, then you've gotten the germs off too.
- Allow kids to try different means of removing the glitter/lotion, using the water, soap, and paper towels. Give them a few minutes, until someone figures out how to get rid of it or it's just taking too long.
- Best solution: warm water+soap+rubbing hands together.

Activity # 3	<b>How diseases spread</b>
Materials	<ul style="list-style-type: none"> <li>• Boundary-marker</li> <li>• Tokens</li> </ul>
Worksheet	N

- Ask kids if there was ever a time everyone got sick at school. Ask whether everyone got sick all at once, or whether it took a few weeks.
- Explain that the more people get sick, the faster the germs spread.
- **Round 1:** One 'sick' person
  - All of the kids close their eyes. Explain that one of the volunteers will tap someone on the shoulder. That person is 'sick' in this game, but if they tell anyone that they are sick, the game doesn't work.
  - While their eyes are still closed, explain that in a moment, everyone's going to get up and start walking around. No one is allowed to talk during

the game, and no one is allowed to run. Whenever you get close to someone, you have to shake their hand. But if the 'sick' person shakes your hand with a special handshake (tickling the inside of the other person's palm), you have to sit down. You play until people figure out who the sick person is or until everyone else is sitting down.

- Do one practice round if they look confused, and then one full round.
- Explain that this is not at all how germs spread: if someone gets sick from someone else, they can make other people sick. Say that we're going to play a few more rounds of the game, and we're going to change the rules a little each time.
- **Round 2: Diseases spread exponentially**
  - If someone gets 'sick' by shaking a 'sick' person's hand, they remain in the game. They have to use the special handshake on people now, who in turn will get sick.
  - The game lasts 2 minutes. Afterwards, ask students who is sick and who is not.
  - Are there more sick people than last time? That's because this is how diseases spread—much faster than if just one person was spreading them.
- **Round 3: Antibiotics**
  - How come everyone isn't sick all the time? A few reasons. One is that doctors can help you. Doctors can figure out who is sick, and then give people cures, which are called *antibiotics*. But if they give someone a antibiotic and they're not sick, it doesn't do anything. And they don't have many cures. They have to be careful.
  - Same rules as Round 2, except...
  - Pick three kids to be doctors. Doctors cannot get sick (so they don't need to shake hands ever) and like everyone else they can't talk.
  - Each doctor gets a handful of tokens. They are still not allowed to talk, but when they think they know that someone is sick, they can walk over and give them the token.
  - If someone has the token and they were sick, they are 'cured'. They are no longer sick, and can no longer become sick. If they *weren't* sick, this has no effect.
  - Play lasts for a little longer—4 minutes, maybe. Afterwards, ask kids who was sick and was cured, who wasn't sick but the doctors tried to cure them anyway, who was never sick, and who was sick at the end of the game.
- **Round 4: Vaccinations**
  - Ask students if anyone has had a shot before. Ask them what shots do.
  - Shots, or *vaccinations*, stop germs from making you sick, but only if you get the shot first. If you're sick and you get a vaccination, it doesn't work.

- Same rules as Round 3, except that doctors are now looking to give tokens to someone who they think *isn't* sick. If someone healthy with a token shakes hands with someone who is sick, they do not get sick. If someone sick is given a token, they are still sick and still spread the germs.
- Recap similarly.
- **Round 5: Quarantine**
  - Ask kids what strategies they have for staying healthy in the game. The answer you're fetching for is that they avoid people they think are sick.
  - One way of dealing with germs is to keep sick people away from everyone else. When you're sick, you don't go to school because you feel crummy, but also so no one else can get sick from you.
  - But, if you stay home from school, chances are someone in your house will get sick too...
  - The basic rules carry over from Round 2. There are doctors, but they don't have 'cure' tokens.
  - Mark a zone in the room as the 'Quarantine Zone'.
  - If a doctor thinks that someone is 'sick', they can tap that person on the shoulder. That kid needs to go to the 'Quarantine Zone'.
  - Once you're in the 'Quarantine Zone', you can't leave until the end of the round. You still can't talk.
  - If you weren't sick before going to the 'Quarantine Zone', you automatically are once inside.
  - Survey the kids like before: Who still isn't sick? Who is sick and wasn't quarantined? Who is sick and was? Who wasn't sick but was quarantined anyway?

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## CONCLUSIONS

- Once you get sick, though, those germs can't get you sick again. Maybe you'll get a fever a month or two later, but it'll be from germs that are just slightly different than the ones that made you sick before.
- That's why when there's a sickness going around the school, people usually don't get sick twice in a row.
- That's because you've developed an *immunity*, which is next week's lesson.