



VOLUNTEER GUIDE

Share your passion for science and innovation with the next generation of scientists and industry professionals! The employee activities available through AstraZeneca's signature STEM program, **Generation Health: How Science Powers Us**, were developed as grab-and-go activities to empower employees to visit a local middle school class.

This guide was created to help employees bring **Generation Health: How Science Powers Us** resources to classrooms and prepare you to work with students in small- and large-group settings. It provides tips and suggestions for employees to engage, explain, discuss, and effectively facilitate STEM activities to support the next generation of scientists and engineers with turnkey activities.

**Please read this volunteer guide in its entirety in advance of engaging with an educator or after-school program leader.*

PREPARING FOR YOUR VISIT

Once you have connected with an educator or after-school program leader, you will want to work together to ensure a seamless visit. You can start by sending a brief email to connect with an educator or program leader. Or, you may want to set up some time together to discuss key details that will make your visit both smooth and successful. A few items you may want to cover:

Pre-visit checklist:

- Thank them for their interest in the program and provide an overview of the program and activity ideas.
- Ask if there are any advance requirements or paperwork needed by the school office or after-school club in order for you to visit.
- Learn about the setting of your visit, how many students you will be working with, and ask if there is anything that would be helpful to know in advance.
- Discuss how much time is available for your visit.
- Determine what the educator would like your role to be in facilitating the activity that day.
- Ask if the educator will be printing out the student worksheets or if he/she would prefer you to bring them with you that day.
- Learn what technology will be available and use that to determine together how the activity will be facilitated (this is especially important to ensure that they have access to tablets or smart phones).
- Ask for any tips! Educators have a honed expertise for connecting with students. Consider your assigned educator a valuable resource.

VIRTUAL PARTICIPATION

When a visit is requested by a group in an area not easily accessible to a volunteer, there may be an opportunity to participate virtually instead of going to the site. There are several free platforms, such as Google Hangout or Skype, that would allow you to share materials, visuals, and chat with students as they are working.

Work with your assigned educator to determine the applicable items from the checklist above, along with which platform will be used to connect online. Download all software and test your connection to the computer in advance of your presentation. You may want to ask the educator, based on the set-up in his/her learning space, how you can help by sharing your screen, and walking students through the directions.

Regardless of whether your visit is virtual or in-person, practice a couple of times in advance. Walk through the information you will be presenting, and time yourself to help work within the time you have available for your visit that day.

THE DAY OF YOUR VISIT

Many community centers and schools will require visitors to sign in and out at the main office and wear a visitor pass. To ensure an efficient sign-in, have your ID ready, and have a printout of the activity you will be facilitating on hand for reference when you need it.

PRESENTING TO STUDENTS

The resources have been designed to follow the below agenda. However, every group is unique and different factors, like available timeframe, will affect the exact nature of how **Generation Health: How Science Powers Us** resources are used.

- Step 1: Volunteer Introduction (3–5 minutes)
- Step 2: Activity (25–30 minutes)
- Step 3: Wrap-up (3–5 minutes)

VOLUNTEER INTRODUCTION

Take a few minutes to introduce yourself. Start off by telling students your name and why you are visiting their class. Tell them about your experience with STEM and medicine development, what your interests were at their age, and how that translated into the career you have today. Explain to them what you will be learning together, and be sure to keep things brief, friendly, and relatable.

Students are going to be very interested and curious about having a special guest, and will likely have a lot of questions! Work with the educator to determine the best method for inviting students to ask questions before, during, and throughout the activity.

ACTIVITY

When previewing the activity materials, note opportunities to share real-life stories that make connections to the topics. Some of the resources may exceed the amount of time allocated for your visit. You may need to select relevant information for the specific situations in which you will be interacting with students. Practice pacing sections of the activity, and make note of areas to pause for questions, engage with a personal story, or point out parts of a visual.

The activities are designed for 6th–8th grade science classes, or for children ages 11–14. Each activity has an expected duration of 45 minutes and includes an overview, materials, procedure, and capture sheets. You will want to review these activities with the educator or leader to determine which activity to facilitate.

ACTIVITY 1

Augment Your Reality About Lung Cancer Overview

Students will visit discovery stations in teams to investigate lung cancer. Students are told a starting point in the scavenger hunt. They will use a free QR reader app and hold their mobile device over a QR code to reveal text or a video clip that will help them answer the question. After working through the first station (their starting point) and determining an answer, students will be provided the next station to visit. Discovery stations will include comparing normal and cancer cells, investigating the causes of lung cancer, comparing the types and exploring the stages of lung cancer, identifying how students can reduce their risk, and identifying current treatment methods, including the use of AI to help identify cancer types and target treatments.

**Please see full activity for detailed instructions.*

What do you need before you visit the classroom? (These materials are also listed in the activity)

- One device (tablet) with built-in camera per group. Devices should have a QR Code Reader App preloaded and tested. Six to ten devices should be enough for the average class. Teachers may already have these available or have a Bring Your Own Device policy where students can use personal devices.
- Station Signs (six) printed and mounted or placed on tables around the room with ample space around each for up to six students to gather. Consider laminating or placing each sign in a sheet protector to make the signs more durable and stand up to use by multiple classes. You can provide two of each station for larger class sizes. This is something you can work together with the teacher to print and make copies.
- Copies of the 3-2-1 Exit Ticket (one per student). This is something you can work together with the teacher to print and make copies.

What do you need to do when you get there?

- Ensure that the station signs are posted.
- Confirm how devices will be distributed or if students have their own.
- Introduce yourself! You can start by sharing a little bit about AstraZeneca and the work you do there. If you have a connection to the lesson either through your work or your personal experience, it is always nice to share that with students to make the visit more personal.
- Follow the procedure in the activity.

What can you do while students are working?

- Say hello! Ask students what excites them about science and what questions they may have about your career or lung cancer.
- Share a story! Students enjoy hearing stories about what you do for fun and what kinds of things you do at work.
- Be available for questions. Rotate to the different groups to help where needed, or base yourself at one station so you can visit with all students.

What can do you after students are done?

- This activity has an exit slip students complete when they finish the activity. If there is time, you could collect those slips and read about some of the things they learned, or answer some of their questions.

ACTIVITY 2

“Escape the Pandemic”

Race the clock to find the cure for a flu pandemic. In this Escape Room activity, groups of students will follow a series of health-related clues and puzzles that will lead them toward the objective: ending the pandemic. Students must answer questions, solve problems, or complete a simple puzzle to move on to the next step. Along the way, they will learn more about the health risks of influenzas, how they impact the body and why they are so contagious, and how people work together in various ways to help stop the spread of disease.

**Please see full activity for detailed instructions.*

What do you need before you visit the classroom? (These materials are also listed in the activity)

Note: You will need *four to five sets of materials*, depending upon how many groups are working at once. It is recommended that you color-code each set of materials (locks, books, etc.) to prevent students from following another group’s clues. If you can’t find different colored locks, use colored construction paper applied to the outside of boxes or books.

- Colored construction paper, colored masking tape, and small slips of paper for clues
- Lockable box with three-digit code lock, mock CDC FLUVIEW Report and map (handouts are included in full activity)
- Diary with a key lock
- False book box with key lock
- UV light pen
- 4 colored dice, with one number on each covered with masking tape
- Images of 4 different strains of influenza, printed and mounted on colored construction paper to correspond with each group (handouts are included in full activity, one set of 4 images per group)
- Second lockable box with five letter ABC lock

What do you need to do when you get there?

- Confirm approximately how many groups you will need to organize depending on the class size and materials you have. If you only want to have one full set, you could work with the teacher to have student groups rotate through the experience.
- Introduce yourself! You can start by sharing a little bit about AstraZeneca and the work you do there. If you have a connection to the lesson, either through your work or your personal experience, it is always nice to share that with students to make the visit more personal.
- Follow the procedure in the activity.

What can you do while students are working?

- Say hello! Ask students what excites them about science and what questions they may have about your career or about infectious diseases.
- Share a story! Students enjoy hearing stories about what you do for fun and what kinds of things you do at work.
- Be available for questions. Rotate to the different groups to help where needed.

What can you do after students are done?

- This activity has an easy success metric: did students escape!? If there is time, discuss how the game tasks mirror actual job requirements in the real world to help students understand why what you're teaching is relevant and introduce students to potential future career options. Finally, review how this activity highlighted the need for prevention behaviors during flu season and the importance of maintaining proper health.

ACTIVITY 3

“Go with The Flow!”

Students will learn first about the basic anatomy and physiology of the heart. Using simple materials, such as cups, straws, and modeling clay, they will form small groups and create simple working models that show how blood flows through the heart. Next, groups will learn about various conditions that raise the risk of cardiovascular disease, such as high blood pressure, high cholesterol, and diabetes as they complete a brief notes sheet. Groups will then work together to use available craft supplies to alter their models to show what happens in the heart when a person has these conditions.

What do you need before you visit the classroom? (These materials are also listed in the activity)

Note: *You will need five to seven sets of materials, depending upon how many groups the class is divided into. While all groups will be making the same initial model, additional supplies may be used by groups to demonstrate how their risk factor can alter the heart function.*

- 3 empty plastic water or clear soda bottles
- 4 bendable straws
- Dough or modeling clay
- Red food coloring
- 2 water bottle lids, with holes pre-drilled
- Mini clothespins
- Various craft supplies (construction paper, scissors, tape, paper clips, markers, etc.)
- Cardiovascular Risk Factors Notes Sheet (1 per group)
- Video—[The Heart and Circulatory System: How They Work](#) (Mayo Clinic)
- Optional: Video—[A Virtual Reality Tour Inside the Heart](#) (Scientific Animations)
- Optional: Cardboard VR goggles for a cell phone (1 per group)

What do you need to do when you get there?

- Confirm approximately how many groups you will need to organize depending on the class size and materials you have.
- If you are facilitating remotely, you will only need to build one model as a demonstration.
- Introduce yourself! You can start by sharing a little bit about AstraZeneca and the work you do there. If you have a connection to the lesson, either through your work or your personal experience, it is always nice to share that with students to make the visit more personal.
- Follow the procedure in the activity.

What can you do while students are working?

- Say hello! Ask students what excites them about science and what questions they may have about your career or about heart health.
- Share a story! Students enjoy hearing stories about what you do for fun and what kinds of things you do at work.
- Be available for questions. Rotate to the different groups to help where needed.

What can you do after students have completed the activity?

- This activity invites students to modify their model of a heart and apply how different risk factors can influence heart health. If there is time, students can present their models and explain the risk factor that influenced its ability to not function properly. Encourage students to share ways these risk factors can be prevented and treated.

ACTIVITY 4

“Detecting Diabetes”

In this activity, students work together as a team of doctors to diagnose a patient who has been admitted to the hospital with heart issues and other strange symptoms. Student groups will be given the patient history and symptoms information and will analyze and perform tests to diagnose the patient. They will work together to determine if the patient is having cardiovascular issues by analyzing an electrocardiogram, complete a urinalysis to determine that there are high levels of glucose and protein in the patient's urine (using urinalysis test strips and simulated urine), and interpret results of various blood tests.

What do you need before you visit the classroom? (These materials are also listed in the activity)

Note: You will need *six to eight sets of materials for the urinalysis lab, depending upon how many groups the class is divided into. Links are provided as examples of the suggested materials.*

- Simulated diabetic urine—measures high in glucose and proteins (10mL per group)
<https://www.carolina.com/physiology-kits/simulated-urine-high/695953.pr?question=simulated+urine+high>

- 6–8 specimen containers (1 per group)
https://www.amazon.com/Dynarex-Specimen-Containers-sterile-100/dp/B004K690RO/ref=sr_1_3?crid=3FBJCPSMEN6JC&dchild=1&keywords=specimen+cups&qid=1614727752&srefix=speci%2Caps%2C203&sr=8-3
- 6–8 containers of Four Factor Urinary Test Strips (1 per group)
<https://www.carolina.com/other-diagnostic-instruments/four-factor-urinary-test-strips/695964.pr>
- Patient Intake form (1 per group)
- Capture Sheet: Urinalysis Results (1 per group)
- Capture Sheet: Electrocardiogram (ECG) Results (1 per group)
- Capture Sheet: Diabetes Blood Test Results (1 per group)
- Overhead screen and projector to show video clips and display information

What do you need to do when you get there?

- Confirm approximately how many groups you will need to organize depending on the class size and materials you have.
- If you are facilitating remotely, you can go through the experiment as a demonstration. Students can use the Urinalysis Results Capture Sheet to conduct and capture their observations.
- Introduce yourself! You can start by sharing a little bit about AstraZeneca and the work you do there. If you have a connection to the lesson, either through your work or your personal experience, it is always nice to share that with students to make the visit more personal.
- Follow the procedure in the activity.

What can you do while students are working?

- Say hello! Ask students what excites them about science and what questions they may have about your career or about heart health.
- Share a story! Students enjoy hearing stories about what you do for fun and what kinds of things you do at work.
- Be available for questions. Rotate to the different groups to help where needed.

What can do you after students are done?

- This activity invites students to review different sets of symptoms to diagnose a patient. If there is time, students can present their ideas to build consensus of their diagnosis as a class. Encourage students to share why it's important to use multiple lines of evidence and data before making a final decision.

ACTIVITY 5

CVRM—Kidneys

In this activity, students will first learn about the anatomy of the kidneys and how they function in the body to filter blood, remove harmful waste, and prevent a buildup of toxins. Next, they will work in small groups to create a working model of the kidney using household items. Student groups will then be given cards that illustrate and describe how conditions such as diabetes and heart disease, if left untreated, can lead to chronic kidney disease (CKD). They will use that context to create a plan and to alter their models in a way that will show how CKD impacts the kidneys. Groups will test and share their model alterations with other groups and discuss preventive and treatment options for CKD.

What do you need before you visit the classroom? (These materials are also listed in the activity.)

Review the activity ahead of time to determine which models you want students to create. Volunteers can also choose to make a healthy kidney as a class model and then invite students to start at the point where they are investigating CKD. Or students can do both models. The building prior knowledge section of the full lesson can be completed by the teacher prior to volunteer engagement.

Note: You will need 6–8 sets of materials for the kidney modeling activity, depending upon how many groups the class is divided into.

For each group:

- Two-liter soda bottle, with a cut on the top half of the bottle to form two pieces
- Coffee filter
- Clear plastic hinged food container (lid and container should be cut apart)
- One sheer knee-high stocking (with the toe end cut off to create a mesh tube)
- One plastic funnel (preferably a long-stem funnel)
- One rubber band or wire twist-tie
- Cup or beaker containing vinegar and yellow food coloring (should be a light-yellow color)
- pH indicator
- Small red beads
- Blue glitter
- A timer or stopwatch (student may use their cellular devices instead)

Materials that should be available for model alterations:

- Tube socks
- Mesh craft tubing
- Plastic tubing of various diameters
- Paper towels of various types and strengths
- Cheesecloth

- Plastic netting
- Tulle
- Tubing hose clamps or dialysis tubing clamps
- Modeling clay or dough
- Scissors or craft knife

Other materials:

- Student devices (laptop, tablet)
- Overhead screen and projector to show video clips and display information

What do you need to do when you get there?

- Confirm how many groups you will need to organize depending on the class size and materials you have.
- Prepare and organize materials ahead of time. The educator may be able to help with materials and setup.
- If you are facilitating remotely, you can prepare the models as a demonstration. When it comes time to demonstrate a CKD disease, select one condition to demonstrate or go through all three conditions. Students can use the Kidney Anatomy and Model to conduct and capture their observations.
- Introduce yourself! You can start by sharing a little bit about AstraZeneca and the work you do there. If you have a connection to the lesson either through your work or your personal experience, it is always nice to share that with students to make the visit more personal.
- Follow the procedure in the activity.

What can you do while students are working?

- Say hello! Ask small groups of students what excites them about science and what questions they may have about your career or kidney health.
- Share a story! Students enjoy hearing stories about what you do for fun and what kinds of things you do at work.
- Be available for questions. Rotate to the different groups to help where needed.

What can you do after students have completed the activity?

- When all disease or condition groups are finished, each should choose one representative or a pair of representatives to share information with the whole class about their conditions and use their altered models to show how they may prevent the kidneys from being effective.

FAMILY ACTIVITY

“Outbreak Escape Room”

**This activity was created for families to investigate pandemics, including COVID-19, using household items.*

In this Escape Room activity, children ages 7–12 will follow a series of health-related clues and puzzles that will lead them toward the objective: ending the pandemic. They must answer questions, solve problems, or complete a simple puzzle to move on to the next step. Along the way, they will learn more about the health risks of viral epidemics, how they impact the body and why they are so contagious, and how people work together in various ways to help stop the spread of disease.

**Please see full activity for detailed instructions.*

KNOW YOUR AUDIENCE

The students you are working with are considered adolescent learners. They are intellectual, social, and emotional learners. They are very curious and enjoy interacting with peers during learning activities. They like to be active learners and are still experimenting with ways of talking and acting as they learn and grow.

A student environment may include a handful of students or up to 40! Sometimes educators will have students seated in small groups and others will have students in rows. Large groups can be challenging to effectively assess if students are engaged or understanding the information presented. It is also difficult to build relationships and visit with students individually in the short amount of time. Walking around the space and making eye contact with different students can help personalize the experience. As students enter the room, or as you enter, say hello and introduce yourself.

And lastly, have fun! This is a great opportunity for you to reach and inspire students in your community and beyond. We hope you find it rewarding, and we thank you for your time and interest in being an ambassador of this program.

ABOUT Generation Health: How Science Powers Us

AstraZeneca and Discovery Education have partnered to create **Generation Health: How Science Powers Us**, a dynamic STEM program for middle school students that aims to make science personal through a focus on healthy living. This program provides hands-on, standards-aligned STEM learning activities where students investigate both preventative measures and innovative solutions to key health concerns in the areas of oncology, cardiovascular, and respiratory health.