

Spacing Out

Classroom Design Challenge



Healthy Actions • Community
Knowledge • Science

FOR GRADES
3-5 6-8 9-12

OVERVIEW

As schools return students to the physical classroom, the COVID-19 pandemic has placed necessary limitations and guidelines on school environments and raised many questions about what is really necessary to safeguard the health of students, teachers, staff and families. In this lesson, students are challenged to design an art room that will afford the social distancing required during the pandemic. Working through the challenge will raise awareness about the complexity of arranging the physical environment to reduce disease transmission in a traditional classroom.

LEARNING OBJECTIVES

Students will design a solution to the problem of how to arrange an art room in a school to allow for social distancing during the pandemic.

SCIENCE, HEALTH AND MATH SKILLS

- Measuring
- Interpreting
- Communicating
- Problem solving

NGSS SCIENCE AND ENGINEERING PRACTICES

- Asking questions and defining problems
- Developing and using models
- Using mathematics and computational thinking
- Constructing explanations and designing solutions

TIME

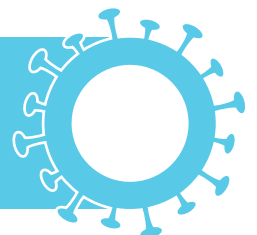
- Two class periods

MATERIALS FOR SCIENCE INVESTIGATION

Students

- Notebook or copy paper
- Ruler or online drawing program (approved by the teacher)
- Droplets image .pptx (1 slide)
- "Spacing Out: Student Design Instructions" .docx

The Centers for Disease Control and Prevention (CDC) is the nation's science-based, health protection agency whose job it is to protect our health, safety, and security from threats here and around the world. During the COVID-19 pandemic they have worked to keep us safe and informed by giving us guidelines to follow.



PROCEDURE

■ ENGAGE

1. Whether you are physically holding class in a school building, or teaching in a virtual classroom, explain to students that face-to-face learning will, or does, look different right now because of the worldwide outbreak of the infectious disease called COVID-19.
2. Explain that the Centers for Disease Control and Prevention (CDC) is the nation's science-based, health protection agency whose job it is to protect our health, safety, and security from threats here and around the world. During the COVID-19 pandemic they have worked to keep us safe and informed by giving us guidelines to follow.
3. You have probably heard about some of these guidelines already, like social distancing. Ask the students for their ideas about what "social distancing" means. Ask, *Can they give examples of how they have personally practiced social distancing?* Accept all answers and discuss students' responses.
4. Explain that the expression, "physical distancing," is more accurate. It means keeping a physical distance of at least 6 feet between you and others in order to reduce possible spread of SARS CoV-2 virus, a type of coronavirus, which causes COVID-19, from one person to another. Ask, *Why 6 feet?* Discuss students answers. Clarify, SARS CoV-2 virus is a respiratory virus mainly spread through respiratory droplets. *That's the distance that droplets from a sneeze, cough, talking, or singing can travel before settling out of the air.*
5. Use the accompanying Project Droplets image .pptx to illustrate how droplets are sprayed into the air when we breathe, talk, shout, etc. Tell students, the droplets carry virus and other small particles in them. Add that bigger droplets don't travel as far as the unseen microscopic droplets. Explain that although it is possible for COVID-19 to be spread via airborne transmission—that is, through smaller particles that remain in the air for longer distances and periods of time—physical distancing helps reduce the main mode of transmission (person to person via droplets).
6. Social or physical distancing, along with wearing a mask and frequent handwashing are some of the best defenses we have right now against this coronavirus, until an effective vaccine is available widely!

■ EXPLORE AND EXPLAIN

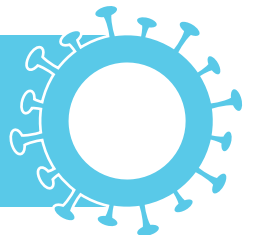
7. Tell students that opening schools and businesses safely during this pandemic has required a lot of new thinking and redesigning of spaces. Ask, *Does anyone have an example of how people have redesigned a space to work in where social distancing is required?* Students might mention measures inside grocery stores or restaurants.
8. Explain that updated guidelines from the CDC now say that students in a classroom, wearing masks, can be seated 3 feet apart. However, adults and teachers, wearing masks, still have to keep a 6 ft. distance from students and other adults.
9. Mention that there are other considerations too. Here are some examples.
 - All students should be seated facing the same direction.
 - Ventilation systems should bring in fresh air, if possible.
 - Materials should be easy to clean and sanitize.
 - Students will not be able to share materials as before, so new ways to store individual supplies are needed.
10. Announce that today you will challenge them to design their own model classroom that maintains the social distancing required between students, and students and adults, while still providing the basics needed in a classroom.
11. Project "Spacing Out: Student Design Instructions". Read over them together to ensure they understand the requirements and ask any questions they may have.

12. Assign the completion date for their work and explain how they will share their designs.
(To be determined by the teacher, see suggestion in the next step).

■ EVALUATE

Tell students that they will be playing the roles of design companies who are trying to win a contract to create and build a new art classroom. Each student or team of students will present and explain their designs for an art classroom space.

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COVID HEALTHY ACTIONS, COMMUNITY KNOWLEDGE AND SCIENCE

■ A SCIENCE-BASED CURRICULUM FOR THE COVID-19 PANDEMIC

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- Author: **Lollie Garay**
- Web and Design Director: **Travis Kelleher**
- Graphic Designer: **Jose Chavero Rivera**
- Technical Reviewers: **Shital Mahendra Patel, Stacey Rose**
- Project Director and Series Editor: **Nancy Moreno**

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Department of Education, Innovation and Technology
Baylor College of Medicine
One Baylor Plaza, BCM411
Houston, Texas 77030
713.798.8200 | 800.798.8244
bioedonline.org | edoutreach@bcm.edu

Spacing Out: Student Design Instructions

DESCRIPTION

The rise in cases due to the SARS CoV-2, a type of coronavirus, and the cause of COVID-19 requires that schools redesign the physical environment to maintain social distancing. Public health officials recommend physical distancing, along with wearing a mask, and frequent handwashing as three things we can all do to help stop the spread of the virus.

PROBLEM

A new school wants to set up an art classroom that measures 34 ft. x 44 ft. in size to enable students to create art projects safely during the pandemic. Your challenge is to design the layout of the room and its contents to maintain a physical distance of 6 ft. between teacher and students, and 3 ft. between students when they are seated in class.

BRAINSTORM

With your team, plan the design, contents and layout of the classroom. You can use the following table to record your ideas.

- *What kind of furniture will you need?*
- *What size will the desks or tables have to be? Remember the teacher needs a desk or table as well.*
- *How many desks or tables are needed?*
- *How will you arrange furniture in the room to maximize the number of students, yet keep everyone at a safe distance?*
- *What other equipment, such as computers, or furniture will you need? (Include a station for cleaning materials and hand sanitizers.)*
- *Where will you put art supplies, personal items, books, etc?*
- *Will you need windows? How many windows?*
- *Where will the entrances and exits to the room be located?*

DESIGN PRESENTATION

Create a floor plan of your classroom, either using paper and pen or pencil or an online drawing program or presentation app.

- You will use the scale of $\frac{1}{4}$ in. = 1 ft.
 - If you are using an 8 $\frac{1}{2}$ in. x 11 in. sheet of copy paper or notebook paper, your classroom “walls” are the very edge of the paper (34 ft. x 44 ft.). Use a ruler for measurements.
 - If you are using an online drawing program, use the same scale and room measurements.
 - Your design must show the placement of all furniture with 6 ft. of distance between them. Indicate where entry or exit doors may be located.
 - Your designs may change as you go through the process—don’t give up! Continue until you have the best functional design!
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BRAINSTORM

PROJECT PLANNING

DESIGN TIP: "When done writing your ideas, do appropriate visual research. A great free resource for visual inspiration is www.pinterest.com. Search 'environmental design' and find the best physical space solutions that reduce the spread of COVID-19. While searching, think about how other designers have solved this problem. How can you adapt those solutions to your space? How can you improve them? When done brainstorming, draw out and develop your ideas until you have reached the best possible functional design for your physical environment. While you work through your design decisions, continually check if they solve the problem." —**Hibah Osman**, *Senior Design Consultant* at HOK

DESIGN QUESTIONS (record your ideas)

1. *What kind of furniture will you need?*
2. *What size will the desks or tables have to be?*
3. *How many desks or tables are needed?*
4. *How will you arrange furniture in the room to maximize the number of students, yet keep everyone at a three to six-foot distance? (Each student 3 feet apart; students and teacher 6 ft. apart.)*
5. *What other equipment, such as computers, or furniture will you need?*
6. *Where will you put art supplies, personal items, books, etc?*
7. *Will you need windows? How many windows?*
8. *Where will the entrances and exits to the room be located?*