

RESOURCE LIBRARY
ACTIVITY : 4 HRS

Think Like a Robot ... And Stay Safe Online!

Students practice safe online and social networking habits by applying common robotic programming strategies.

GRADES

5 - 9

CONTENTS

6 Images, 1 Link, 1 Video, 4 PDFs

OVERVIEW

Students practice safe online and social networking habits by applying common robotic programming strategies.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/act-robot-and-stay-safe-online/>

Program



DIRECTIONS

1. Activate prior knowledge by discussing robots that perform human-like jobs.

Begin a whole-class discussion on robots, asking students to brainstorm robots and/or automatons that are in current use. As they are suggested, or to help prompt more ideas, share images of robots (for example, robotic vacuum cleaners, robots used in factories, telepresence robots such as the Beam, and military robots such as drones. If you have access

to one, a robotic toy is a good physical example). Ask: *How do you think these robots decide what to do or choose a plan of action?* Accept any brainstormed ideas, jotting down suggestions as they are made.

2. Discuss whether robots "think."

Talk to students about the fact that thinking—like we humans think—is a difficult process that involves a wide range of processes, including consciously remembering facts and information, solving concrete or abstract problems using known information, and incorporating reasoning, insight or ingenuity. It includes brain processes as well as self-awareness and a variety of concepts that are simply "human." What computers do is different from what we humans do when we actually think.

Read or project the following information to students:

Robots operate by processing information in different ways. Some basic industrial robots and simple programmable robots operate by repeating a series of specific, programmed steps and get very little if any feedback (sensing) from the environment. A more sophisticated robot—such as a household vacuuming device—does use sensors to tell it when it will hit a wall or other obstacle, thus enabling avoidance behavior. "These systems work by taking outputs from sensors, sending them to a microprocessor and running predetermined software routines to produce instructions..."¹ that make the robot change its movement. We might consider this slightly more "intelligent" than a simple robot, but it isn't thinking, as we know it.^{[1}Source: <http://www.electronicweek.com/news/business/viewpoints/robots-think-2014-09/#sthash.W2NJbkxg.pdf>]

Some people think that robots already use something called "artificial intelligence" to recreate the human thought process. Although some AI machines can already do some specific elements of intellectual ability, we are nowhere near achieving the level of "thinking" that may be some day available.

3. Introduce "Sense-Plan-Act" information processing.

Project the video clip "Sense-Plan-Act." Ask a volunteer to list the three steps that most robots repeat in all operations and write them on the board or chart paper: Sense. Plan. Act.

Next, have students watch the "How Robots Sense, Plan, and Act" video. As they watch, have them add any additional revelations to their notebooks about how featured robot processes information using "sense, plan, and act." Discuss how the information processing you saw robots doing in the video clip might be different from how humans think. Explain to students that humans' abilities to think give us a considerable edge over robots when it comes to day-to-day activities, including things that keep us safe.

4. Review students' social networking experience with graphs and polls.

Explain that students are going to apply the sense-plan-act strategy to safe online and social networking habits. Project one of the graphs found on [The Atlantic's website](#), and then briefly discuss the most popular social networking sites reported by teens in a recent survey. Make a list on the board or chart paper of the sites included in the graphs and discuss each one (for example, how it works, whether it includes the ability to connect with others, etc.). Conduct your own survey, asking students which of the sites they use daily, weekly, occasionally, and so on. Create (or have a student create) a graph on the board or chart paper to compare your class results with those in the example graph.

5. Explore how the robot's three-step sense-plan-act strategy can be used by humans in situations where a decision must be made before acting.

Ask students if they've heard of any dangers associated with social networking and allow a few volunteers to share stories they've heard or experienced with the class. Ask: *What would you do in the same situation? What "feedback from your senses" might make you suspect something isn't right? How might the robot's three-step programming strategy (sense-plan-act) help you decide what to do in these situations?*

6. Apply the three-step plan to an online sample scenario.

Remind students that a robotic vacuum cleaner senses *physical* cues—those that are seen or felt in the physical world. But in dealing with online dangers, sometimes the cues aren't so obvious, and paying careful attention to all the information at hand (called "deliberate thinking") is important.

Ask for a volunteer to help you read aloud the following online chat scenario from the Online Sample Scenario handout. Tell the students that we're going to make up a fictional online person who goes by soccerfan5681 online. Introduce your volunteer. Say:

..... is going to help me with this scenario by playing the fictional part of "SoccerStar," who spends a lot of time instant messaging on both his computer and cellphone over the Internet. SoccerStar just got a contact request on Skype from the username "soccerfan5681." He immediately clicked "accept," even though the name was unfamiliar, because a huge contact list is the sign of being popular ... right? I'll read the part of soccerfan5681. Remember, although we'll be reading it aloud, this conversation actually took place in texts.

Then, read through the Online Sample Scenario handout. After, ask students if the fictional scenario they just heard sounds like a pretty common online or texting conversation. Then use a think-aloud strategy to model the three-step plan, using this scenario as your example:

Now I'm going to pretend I'm Chris in this Skype conversation.

Sense: *First I will use my senses to analyze what is happening—*

- *What do my virtual senses tell me about soccerfan5681? Hmmm, not much. All I have to go on is what he (or she) tells me ... I don't have any proof that he is who he says he is.*
- *Why does soccerfan5681 need to know my name and where I live? We can chat without it.*

- *What kind of questions is he asking me? They're pretty personal ... my name, age, and location.*
- *How does this make me feel? What is my gut reaction? Are there any red flags?*
- *Is it smart to meet face-to-face with somebody I just started chatting with and don't know personally?*

Plan: Now I'll use deliberate thinking to plan my responses—

- *Plan out a response to the request—figure out what I'm going to say.*
- *What questions can I ask to find out more about soccerfan5681?*
- *What is the best way to end this conversation?*

Act: Take action.

- *Politely tell soccerfan5681 that I'm not able to meet up with him.*
- *Say, "I have to go now" and end the conversation.*
- *Report the conversation and my concerns to an adult.*

After modeling the three-step strategy, tell students to imagine that soccerfan5681 is NOT who he said he was—not a 13-year-old named Pat—and may have been someone with intentions to hurt Chris.

Lead a discussion to debrief the scenario. Ask:

- *What did soccerfan5681 know about Chris before he ever sent out the contact request? (He knew who Chris was, and was able to find him because Chris wasn't careful about online identification.)*
- *What other information did Pat get from Chris during their conversation? (He got Chris' real name, age, city [because the park was named for it], and state, and he was trying to find out the time and place where Chris would be in the near future.)*
- *When someone asks a lot of "friendly" questions in a social networking situation, do you feel like it's only polite to answer?*
- *Do you answer without thinking about what someone could do with that information? Would you be embarrassed to not answer?*
- *If Chris had been applying sense-plan-act, using senses to look for virtual cues, what remarks or questions should have caused concern in this Skype chat? At what point in the conversation should Chris have stopped talking to soccerfan5681?*

- *Have you ever found an online conversation with a stranger to be unsettling? What cues were your senses picking up that made you hesitate?*
- *What should someone do when that feeling happens? (Allow students to brainstorm ideas; for example, blocking the contact and telling a trusted parent or caregiver.)*

Write the words *automatic* and *deliberate* on the board. Use the scripted text below—or something similar—to wrap up this step.

How many of you have written the wrong year on a paper in January? How many have bumped into a mannequin at a store and said “Excuse me” before realizing it wasn’t a real person? These are examples of automatic behaviors, where you act without purpose, or deliberate thinking. No big deal, right? But it can be dangerous to automatically respond online, like when Chris answered soccerfan5681’s questions—especially if they are asked in a friendly or polite way, or mixed in with a lot of other questions.

7. Practice the three-step plan with small group scenarios.

Divide the students into small groups of 3-5 students and distribute a single Scenario Card to each group. If possible, give each group a different card. In each group, appoint a discussion leader to read the scenario and the questions in the Sense-Plan-Act and Debrief sections. This person will lead a discussion about the scenario.

After giving enough time for all groups to conduct a full discussion, pass out a different Scenario Card to each group, choosing a different member to be the new discussion leader. Repeat the procedure until all scenarios are reviewed by every group (or as many as time allows).

8. Bring the groups together for a whole-class debriefing.

Use the Scenario Cards: Debriefing Notes handout to frame your discussions around the scenarios that student groups just completed. Ask:

- *The scenarios each posed different types of online dangers. What were some of them? (Personal [both physically and emotionally], financial, and technology dangers.)*
- *In which scenarios was a danger more obvious to you than others? Explain why.*
- *Which scenarios seemed to pose a potential physical danger to someone? (NOTE: Use the teacher handout Scenario Cards: Debriefing Notes to discuss specific hazards associated with each scenario.)*
- *Compare the actions of Ben and Prudence, who both created a personal threat through the posting of pictures. Do you think Ben (who grabbed Tia's pictures from her own online collection) was as much at fault as Prudence (who took a photo of Laura in a public restroom and posted it online)? Why or why not?*
- *Do you think a threat to your technology or finances is more or less troubling than a personal threat? Explain your reasoning.*
- *Have any of you or someone you know ever reacted automatically in an online situation? (Allow volunteers to share their experiences and discuss how "thinking like a robot"—deliberate thinking—might have helped them make a smarter decision.)*
- *What should you do if the cues you sense in an online situation make you uncomfortable?*

Tip

Do you have access to an iRobot Roomba vacuum cleaner or a robotic toy? Concrete examples of robots will enhance the lesson.

Tip

If your school or center allows, you might want to project some of the social networking sites to explore with the class during Step 3.

Tip

Many of the scenarios reviewed in this lesson involve the dangers of "oversharing." Monitor the small- and whole-group discussions carefully to make sure students don't exhibit this behavior in sharing personal information about themselves, their families, or their online passwords in class!

Tip

Sharing personal online experiences should be voluntary.

Modification

To complete this lesson in one day, you can simplify the steps by skipping Step 3, completing Step 6 as a whole-class activity, and eliminating the assessment activity.

Alternative Assessment

Write the following two lists on the board or chart paper:

Social Networking Platforms

- Facebook or Google+
- Twitter
- Instagram, Vimeo, or other photo/video sharing platform
- Skype or other instant messaging service
- Cellphone (texting or email)
- Minecraft, World of Warcraft, or other online game with chat

Online Hazards

- Personal threats (physical or emotional)
- Financial threats (scamming for money or hacking credit account information)
- Threats that damage computers, cellphones, or other technology

Divide the class into groups of 3-5 students. Have them select a social networking format and an online hazard from the lists and develop their own scenario or skit that either demonstrates or requires someone to use the three-step decision-making strategy to avoid a potential threat.

Explain that the format of their presentation is open to each group's own creativity and will depend on both the social networking format and the type of threat they wish to illustrate. For example, groups might want to script the entire scenario and perform it as a skit, dramatizing what happens to someone who doesn't use the three-step strategy. Or they might develop only the predator's role, brainstorming persuasive techniques they might use to get personal information from an unsuspecting person, and then in their presentation asking for a volunteer to help them role-play the conversation, allowing the volunteer to use the three-step strategy to try to avoid the hazards.

Set aside time for group presentations. The teacher can then analyze the presentations to determine if the designers understand how online predators operate to gather personal information. It can also be an assessment of the use of the three-step decision-making strategy in avoiding these hazards.

Extending the Learning

Reproduce Step 3 of the lesson as an out-of-class project by having students work independently or in pairs to conduct polls of students in other grades or schools. Distribute copies of the Social Networking Survey handout. Assign a time limit for polling peers, and have teams create graphs or PowerPoint presentations to share their results with the class.

OBJECTIVES

Subjects & Disciplines

Learning Objectives

Students will:

- Identify three types of potentially hazardous online situations
- Describe and demonstrate a three-step plan for making decisions about online interactions, referencing a common robotic programming strategy
- Understand the difference between acting automatically and deliberately

Teaching Approach

- Learning-for-use

Teaching Methods

- Brainstorming
- Discussions
- Role playing
- Simulations and games

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Information, Media, and Technology Skills
 - Information, Communications, and Technology Literacy
 - Learning and Innovation Skills
 - Critical Thinking and Problem Solving
 - Life and Career Skills
 - Initiative and Self-Direction
- 21st Century Themes
 - Health Literacy
- Critical Thinking Skills
 - Applying
 - Evaluating
 - Understanding

National Standards, Principles, and Practices

ISTE STANDARDS FOR STUDENTS (ISTE STANDARDS*S)

- **Standard 4:**

Critical Thinking, Problem Solving, and Decision Making

- **Standard 5:**

Digital Citizenship

- **Standard 6:**

Technology Operations and Concepts

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Optional: If you happen to have a robotic vacuum cleaner or toy available, bring it in!
- Whiteboard, chalkboard, or chart paper

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

SETUP

Duplicate all handouts, cut apart the Scenario Cards, and prepare to project the video and any handouts.

GROUPING

- Large-group instruction
- Small-group work

BACKGROUND & VOCABULARY

Background Information

Prior Knowledge

Recommended Prior Activities

- None

Vocabulary

Term	Part of Speech	Definition
automatic behavior	<i>noun</i>	performance of a common action without attention to all cues or new information.
bullying	<i>noun</i>	use of physical or psychological force to abuse or intimidate others.
deliberate thinking	<i>noun</i>	conscious attention to new information and clues in planning actions.

Term	Part of Speech	Definition
expectation of privacy	<i>noun</i>	belief that all citizens are protected from unwanted intrusion on their words or actions.
feedback	<i>noun</i>	reaction or response to a particular process or activity.
humanoid	<i>adjective</i>	having human characteristics or form, or resembling a human being.
online game	<i>noun</i>	browser-based video game that can be played alone or with a large number of people simultaneously.
sensor	<i>noun</i>	instrument that receives a signal and transmits data about that signal, such as data on light or heat.
social network	<i>noun</i>	online community where members share information with each other.

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