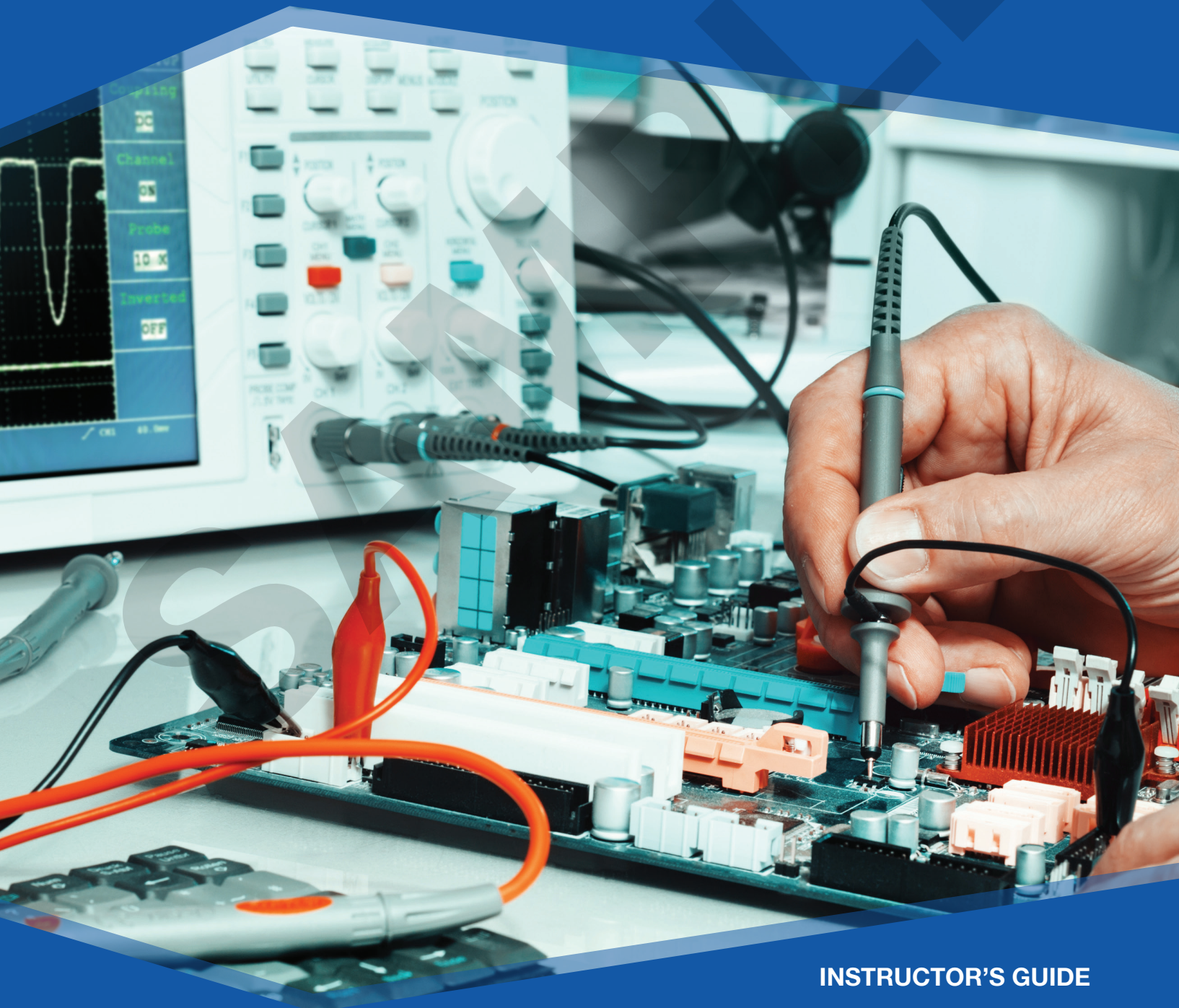




# Science H

*(Technology)*



INSTRUCTOR'S GUIDE

## Science H

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Conservation, Robots, and Technology

By the Sonlight Team

*The heavens declare the glory of God; the skies  
proclaim the work of his hands.”*

Psalm 19:1 (NIV)

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“Do to others what you would have them do to you”  
(Matthew 7:12).

“The worker is worth his keep” (Matthew 10:10).

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## Table of Contents

### 1 Introduction to Your Instructor’s Guide

- Table of Contents

### 2 Schedule, Notes and Activity Sheets

- A Weekly SCHEDULE for Science
- ACTIVITY SHEET ANSWER KEYS

## Level H: Science

Days 1–4: Date: \_\_\_\_\_ to \_\_\_\_\_

Week Overview																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	

Week 1				
Date:	Day 1	Day 2	Day 3	Day 4
Robotics	chap. 1 pp. 1–14	chap. 1 pp. 15–23	chap. 2 pp. 27–33	Lab pp. 24–26
Activity Sheet Questions	#1–8	#9–14	#15–18	#19–22
Supplies	<b>We provide: HSK</b> — DC motor (use the taller motor without wires), electrical tape, foam cup, 2 AAA batteries, rubber band, 1' insulated electrical wire (with red and white plastic coating), one jumbo craft stick, cork. <b>You provide:</b> wire cutter, foam mounting tape (or duct tape), 3 markers, cardboard box lid, plain white or light-colored paper, optional: pipe cleaners, craft sticks, styrofoam or wooden pieces, decorative glue-ons, googly eyes, glitter pens, quick-dry glue, or hot glue gun.			
Shopping/Planning List	<b>For next week:</b> ½ cup warm water, 3 teaspoons water, 4 teaspoons white (Elmer's type) or gel glue, food coloring (optional), plastic bag or cotainer.			
Additional Subjects:				

### Activity Sheets

Day <b>1</b>	#1–8
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Find Activity Sheets after each week's notes, and answer the questions listed on the schedule page. We provide an Answer Key page directly after these notes and before the Student Activity Sheets.

You do not have to do every question on the Activity Sheets. Feel free to adjust and/or omit activities to meet the needs of your children. We cover the same concepts repeatedly throughout the year (and years to come!) to enable students to learn "naturally" through repetition and practice over time.

Any question marked **Challenge:** will be just that—a challenge for your children. While we believe the material covered in the challenge questions is worthwhile for your children to know, it may not Kelly Monico be specifically explained in their reading assignment. As always, if you think any question is too difficult for your children, please feel free to skip.

Feel free to let your children do those activities that they enjoy and simply talk through others. We have provided space for you to fill in answers as your children respond verbally, or simply check off the items that you discuss.

**Remember:** This program is designed for you to use to meet your children's needs. It is not meant to use you!


**Suggestion:** Your Activity Sheets might work more easily in a small binder for your children to keep and use as assigned. If you have more than one child using this program, extra Activity Sheets can be purchased for each child (Item # HSG1).

**Note:** There is an error in the book on page 10. The arrow pointing down under "Does it see, touch, hear, smell, or detect radiation?" should say "No."

Day <b>2</b>	#9–14
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#### Mars Rovers Research

Today's Activity Sheet assignment asks your students to visit [nasa.gov](http://nasa.gov) to look up the latest news on *Opportunity* or *Curiosity*, two Mars Rovers. The NASA site is fairly easy to navigate. If they type "Mars Rovers" into the search pane, they should find pages of information they can use for this assignment. Please provide them with whatever assistance or guidance they may need as they use the Internet today.

The book mentions a robotic arm implant that should be widely available by 2015. We conducted some research and cannot say for certain that it is “widely” available, though we did find some interesting videos about them. For links to these videos, see our IG Links page. 

**Note:** Duct tape can be used in lieu of foam mounting tape for this experiment.

**Note to Mom or Dad:** In Week 30, your students will bury two bags of garbage in the ground, water them for two weeks and then dig them up to observe how the items inside decompose. Since this lab will probably be easiest to complete during warmer months, please consider rescheduling this lab if you plan to complete Week 30 during the winter before the ground thaws. If you do not have a yard, also decide where your students could bury the garbage without bothering anyone, and yet have it remain undisturbed for the entire two week period. ■



### Science H: Week 1 Activity Sheet

#### Robotics

1. To many roboticists, what cycle must a robot be able to complete? Name each step in the cycle in the boxes, and then use the lines below to describe what happens at each step. On the last line, list the part needed in order to perform each step. (p. 6)

(Sense)	(Think)	(Act)
(To take in information about its surroundings)	(To use the information to choose the next step to take)	(To do something that affects the outside world)
Part: _____	Part: _____	Part: _____
(sensor)	(controller)	(effector)

2. Do all roboticists agree that a robot must be able to follow the above steps in order to truly be a robot? Why or why not? (p. 7)
- (No, some think that any machine that can act on its own is a robot. It doesn't necessarily have to make decisions or "think" in order to be a robot.)

3. How do more simple models help further the field of robotics? (p. 7)
- (More simplistic models make it easier for hobbyists to get involved and study in robotics because the machines they use are cheaper and easier to build. With more people involved, our society is able to contribute more creative energy to the science and possibly make more advancements than if only specialists could participate. The models they build can help scientists build more complicated versions.)



**Robotics**

1. To many roboticists, what cycle must a robot be able to complete? Name each step in the cycle in the boxes, and then use the lines below to describe what happens at each step. On the last line, list the part needed in order to perform each step. (p. 6)

<div></div>	➡	<div></div>	➡	<div></div>
<div></div>		<div></div>		<div></div>
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<div></div>		<div></div>		<div></div>
Part:		Part:		Part:
<div></div>		<div></div>		<div></div>

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