

### **3.A.1 Sparky's Engineer**

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*Exploring various types engineering*

<b>Grade Level</b>	3
<b>Sessions</b>	(1): 1 at 50 minutes
<b>Seasonality</b>	Suggested as introduction to Technology/Engineering
<b>Instructional Mode(s)</b>	Whole class, Individual
<b>Team Size</b>	N/A
<b>WPS Benchmarks</b>	None
<b>MA Frameworks</b>	None
<b>Key Words</b>	Aeronautical Engineer, Biomedical Engineer, Chemical Engineer, Civil Engineer, Electrical Engineer, Engineer, Fire Protection Engineer, Mechanical Engineer, Software Engineer

### **Summary**

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The children's book Sparky's Engineer introduces students to a variety of engineering professions. A "Know, Want to know, Learned" (KWL) chart introduces the lesson. A worksheet with writing prompts concludes the lesson by allowing students to explain their knowledge of one particular type of engineering.

### **Learning Objectives**

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*2002 Worcester Public Schools (WPS) Benchmarks for Grade 3*

This lesson does not address individual WPS Benchmarks; rather, it introduces students to various types of engineering and prepares them to learn about the Engineering Design Process (EDP).

*2001 Massachusetts Frameworks for Grade 3*

This lesson does not address individual MA Frameworks; rather, it introduces students to various types of engineering and prepares them to learn about the Engineering Design Process (EDP).

### **Additional Learning Objectives**

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1. Students will learn to identify various types of engineering (mechanical, fire protection, biomedical, etc.).

2. Students will learn to describe the functions of various types of engineers (design software, design buildings, etc.).
3. Students will recognize that (a) engineering, as a profession, is accessible to them, and that (b) engineers are a diverse group of people.

### **Required Background Knowledge**

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None

### **Essential Questions**

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1. What is an engineer?
2. What is a(n):
  - a. Aeronautical Engineer
  - b. Biomedical Engineer
  - c. Chemical Engineer
  - d. Civil Engineer
  - e. Electrical Engineer
  - f. Fire Protection Engineer
  - g. Mechanical Engineer
  - h. Software Engineer?
3. What type of job does each engineer do?
4. What perception of engineering does one have before reading Sparky's Engineer? After?

### **Introduction / Motivation**

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The instructor might begin the lesson with a KWL chart: “What do we **Know**, What do we **Want** to know, What did we **Learn**” (see Appendix A: Instructor’s Notes). (S)he might ask students whether or not more than one type of engineer exists (5 minutes).

## **Procedure**

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1. Read Sparky's Engineer to the class using the Teacher's Edition.
2. Lead students through the attached worksheet (see Sparky's Engineer).
3. If time permits, students may complete additional writing prompts (see Lesson Extensions) or share worksheet responses with the class.

## **Materials List**

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<b>Materials per class</b>	<b>Amount</b>	<b>Location</b>
<u>Sparky's Engineer:</u> <u>Teacher's Edition</u> Children's Book	One	Worcester Polytechnic Institute

<b>Materials per student</b>	<b>Amount</b>	<b>Location</b>
<u>Sparky's Engineer</u> Worksheet	One	End of lesson plan – print or photocopy

## **Vocabulary with Definitions**

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1. *Aeronautical Engineer* – designs machines that fly such as airplanes and spaceships.
2. *Biomedical Engineer* – designs tools used by doctors, nurses and technicians; the tools assist the sick, injured, or disabled and include wheelchairs, medicine, stitches and prosthetics.
3. *Chemical Engineer* – designs chemicals and chemical products through chemical processes; products may include air filters, rocket fuel, and non-freezing pipes.
4. *Civil Engineer* – designs tunnels, roads, buildings, bridges, and dams using various materials such as soil, rocks, and concrete.
5. *Electrical Engineer* – designs electrical circuits found in items such as radios, televisions and computers.
6. *Engineer* – uses ideas from science and math to help people do work faster and better; helps people stay healthy, safe, and comfortable; uses tools to draw, build, and invent.

7. *Fire Protection Engineer* – designs systems to help prevent and respond to fire in various structures.
8. *Mechanical Engineer* – designs machines and devices that have moving parts such as automobiles and various other types of machines.
9. *Software Engineer* – designs computer programs.

### **Assessment / Evaluation of Students**

The instructor may assess the students in any/all of the following manners:

1. Note class participation during reading of Sparky's Engineer.
2. Read entries in Engineering Journals; determine whether students understand a type of engineering and can articulate the reasons for selecting the given type.

### **Lesson Extensions**

1. The instructor might use this lesson as an introduction to the Technology/Engineering and the Engineering Design Process.
2. Ask students to respond to additional writing prompts such as:
  - a. Would you like to be an engineer? Why/why not?
  - b. Has your perception of engineering changed since reading Sparky's Engineer?
  - c. Describe three facts that you learned while reading Sparky's Engineer.

### **Attachments**

1. Sparky's Engineer Worksheet

### **Troubleshooting Tips**

None

### **Safety Issues**

None

### **Additional Resources**

None

## **Appendix A: Instructor's Notes**

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The following is an example of a KWL chart:

### **KWL Chart**

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What do we <b>Know</b> ?	What do we <b>Want</b> to know?	What did we <b>Learn</b> ?

## Sparky's Engineer

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. What is your favorite type of engineer from Sparky's Engineer?

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2. What does this type of engineer do?

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3. If you could be an engineer, what kind of engineer would you like to be? Why?

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4. If you have time, draw a picture of something that your favorite type of engineer might design. Use the back of this worksheet.