

Department of Career and Technology Teacher Education

LESSON PLAN

Teacher: Louis Pichardo

Class: 11th Grade Electrical Installation

Date: 5/2/2020

UNIT: Lighting

LP# 1 of 10

LESSON TOPIC: The incandescent light bulb

ESSENTIAL QUESTION: What is an incandescent light bulb?

MATERIALS/EQUIPMENT:

Laptop, projector/smartboard, slide switching remote, clear incandescent light bulbs.

SPECIAL TECHNOLOGY:

PowerPoint program (For students who associate images with notes), YouTube (For students who grasp concepts through visuals), Kahoot (To engage students through gamification), and internet access (To allow YouTube and Kahoot to function properly).

TECHNOLOGY BACKUP PLAN:

If the PowerPoint program fails, the whiteboard will be used to handwrite the notes of the lesson. If the slow-motion YouTube video is not available, I will demonstrate the burning out and start-up of a light bulb myself in real-time with an old light bulb. If students don't have access to phones or the internet I will implement game-style summary questions where students who answer correctly receive an incentive.

LEARNING STANDARD(S) ADDRESSED BY LESSON:

1. Learning Standards for Career Development and Occupational Studies (C.D.O.S.) – Standard 1 (Career Development): Students will be knowledgeable about the world of work, explore career options, relate personal skills, aptitudes, and abilities to future career decisions.
2. C.D.O.S. – Standard 2 (Integrated Learning): Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.
3. C.D.O.S. – Standard 3a (Universal Foundation Skills): Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.
4. C.D.O.S. – Standard 3b (Career Majors): Students who choose a career major will acquire the career-specific technical knowledge/skills necessary to progress toward gainful employment, career advancement, and success in postsecondary programs.

INSTRUCTIONAL OBJECTIVES:

At the end of the lesson, students will be able to:

1. Explain how an incandescent light bulb works.
2. Identify the advantages of incandescent light bulbs.
3. Identify the disadvantages of incandescent light bulbs.

OPENING TASK:

On a sheet of paper:

1. Define illuminate.
2. Define load.

MOTIVATION:

Paint this situation in your head: You wake up in the middle of the night, its pitch black, your phones dead, and you have to pee.

When you get out of bed, what is the first thing that you will want to do in order to get to the bathroom?

- You will want to turn on the lights.

The light doesn't work, you hit your pinky toe on a corner, and know that light bulbs are important even in the smallest ways.

DEVELOPMENT/PRESENTATION:

Slide 1: The Filament

1. **Out of all the parts on this diagram, which one creates the light inside of an incandescent light bulb?**

Number 3 creates the light inside of the incandescent light bulb.

Notes: The filament is made of a highly resistive material called tungsten.

2. **As the rope moves forward, what will you start feeling in your hands?**

As the rope moves forward, you will start to feel heat.

3. **Let's say this was now the filament inside the light bulb, what will that heat eventually do?**

The heat will eventually be converted into light.

Slide 2: Producing Light

Explain the process of producing light with a slow-motion YouTube video of a light bulb turning on.

<https://www.youtube.com/watch?v=deXOk6G5ALs>

Notes: The filament resisting current flow creates so much heat, that light is produced.

Slide 3: Incandescent light bulb advantages

4. **Where can we buy incandescent light bulbs?**

We can buy them in Home Depot, the deli, etc.

5. **Why do people think of buying them over other types of light bulbs?**

We would think of buying them over others because of their cheap price.

Alternative: **How much can you get one for?**

Notes: Incandescent light bulbs are available in many stores, cheap to purchase, and offer more lumens per dollar than any other type of light bulb.

Explain lumens per dollar.

Slide 4: Incandescent light bulb disadvantages

6. **If I throw this light bulb at you and it falls, what will happen?**

The glass will shatter all over the floor.

7. **What will happen after a week of constantly having this type of light bulb on?**

The light will burn out.

Explain the process of a light bulb dying after prolonged use using slow-motion YouTube video of a light bulb burning out. <https://www.youtube.com/watch?v=EVgWltdTWFI>

8. **As soon as the light bulb turns on, what will you feel?**

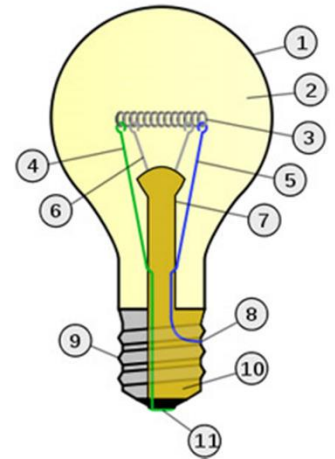
You will feel heat.

9. **Why is that heat dangerous?**

The heat is dangerous because it can eventually cause certain materials found in homes to combust.

Notes: Incandescent light bulbs are fragile, have a short life-span, and create much heat.

Incandescent light bulbs now need to be a minimum foot away from any storage space in closets.



ACTIVITY:

1. Students will discuss the operation of an incandescent light bulb with a partner.

SUMMARY/EVALUATION:

Using the Kahoot platform in multiple-choice format:

1. How does an incandescent light bulb produce light?

The incandescent light bulb produces light by having the filament resist the flow of electricity, creating enough heat to produce the visual light.

2. What are the advantages of incandescent light bulbs?

The advantages of incandescent light bulbs are that they are available in many stores, cheap to purchase, and even providing the most lumens per dollar compared to other types of light bulbs.

3. What are the disadvantages of incandescent light bulbs?

The disadvantages of incandescent light bulbs are that they are fragile, have a short life-span, and produce much heat.

HOMEWORK:

1. Students will summarize what they found interesting about the lesson.