

**Southwest Center for Microsystems Education (SCME)  
University of New Mexico**

# **Introduction to Sensors Learning Module**

This booklet contains four units:

Pre-test (Knowledge Probe)

Introduction to Sensor Primary Knowledge (PK) unit

Activity – What are Sensors?

Final Assessment

*This learning module is one of three SCME modules that discuss the types of components found in microelectromechanical systems (MEMS). This module covers “sensors” – what they are, how they work and how they are used in both macro and micro-sized systems. An activity provides further exploration into specific sensors and how they are used in everyday devices. Two related learning modules cover MEMS transducers and actuators.*

Target audiences: High School, Community College, University

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# Introduction to Sensors

## Knowledge Probe

## Instructor Guide

### Notes to the Instructor

This is the pre-assessment for the *Introduction to Sensors Learning Module*.

*Introduction to Sensors* is a Learning Module consisting of the following units:

- Knowledge Probe (Pre-assessment)
- Introduction to Sensors
- Activity: What are Sensors?
- Final Assessment

This companion Instructor Guide (IG) contains both the questions and answers for the assessment questions. The answers are indicated in **red**.

### Introduction

*This learning module is one of three SCME modules that discuss the types of components found in microelectromechanical systems (MEMS). This module covers “sensors” – what they are, how they work and how they are used in both macro and micro-sized systems. An activity provides further exploration into specific sensors and how they are used in everyday devices. Two related learning modules cover MEMS transducers and actuators.*

The purpose of this assessment is to determine your current understanding of sensors.

1. A pressure sensor, barometer, gas flow sensor and altimeter are all examples of
  - a. thermal sensors
  - b. electrical sensors
  - c. chemical sensors
  - d. mechanical sensors**
2. Which of the following BEST describes a sensor? A device that
  - a. quantifies a value on its input and produces a readable output.**
  - b. produces a readable output representative of a change.
  - c. converts one form of energy to another form of energy.
  - d. converts a change on the input into a proportional movement.

3. What type of MEMS sensor is currently used for biohazard detection, medical diagnosis, and food processing?
  - a. Thermal Sensor
  - b. Mechanical Sensor
  - c. **Chemical Sensor**
  - d. Electrical Sensor
  
4. Today's airbag deployment sensors use micro-\_\_\_\_\_ to sense a particular motion requiring the need for airbag deployment.
  - a. gyroscopes
  - b. **accelerometers**
  - c. photodetectors
  - d. barometers
  
5. Which of the following is NOT a sensor?
  - a. Infrared thermometer
  - b. Geiger counter
  - c. Enose
  - d. **Thermister**
  
6. MEMS pressure sensors use a \_\_\_\_\_ over a reference chamber to sense a change in pressure and convert that change to an electrical output.
  - a. Gyroscope
  - b. **Diaphragm**
  - c. Capsule
  - d. RTD
  
7. A transducer is to a sensor as
  - a. **the eyes are to the brain**
  - b. the sun is to a plant
  - c. a book is to its cover
  - d. wood is to a fire
  
8. Characteristics of micro-sized sensors when compared to macro-sized sensors include
  - a. cheaper to mass produce, more accurate, less durable.
  - b. more expensive to mass produce, more accurate, more durable.
  - c. more reliable, more accurate, less durable.
  - d. **more reliable, more accurate, longer-lasting.**

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