

# CURRICULUM

## GUIDE

Science - Grade 7

Providence  
Schools



### **Background**

Providence Schools teachers and administrators worked collaboratively with consultants from the Charles A. Dana Center at the University of Texas at Austin to develop the mathematics and science curriculum frameworks. The curriculum frameworks encompass two critical questions:

- Content Standards that establish clearly defined expectations for all students, helping to answer the question, ***What do students have to learn?***
- Performance Standards that determine performance expectations for content standards, helping to answer the question, ***How well do the students have to learn it?***

The curriculum framework provides a work plan that directs the instruction delivered in every classroom in every school in the district. Instruction—the way the curriculum is presented to students—will focus on the needs of students.

### **Purpose and Use of Curriculum Guides**

Curriculum Guides for the curriculum for each grade and subject outline the approximate number of days that each unit in the curriculum will be taught; describe the content to be learned; and list the essential questions that students should be able to answer by the end of the unit.

Parents should become familiar with the Curriculum Guides. You should know when your child is being taught different topics. You should also know the essential questions that your child should be able to answer by the end of each unit.

It is important that you understand that you do not have to be familiar with the content that your child is learning in order to help them with their studies. There are basic questions that you can ask to determine if your child understands the content.

***Ask your child what she is learning in each subject***  
*Does she understand the topic? Is the unit exciting or boring?*  
*What specifically does she like or dislike about the topic?*  
*Does she understand how the topic relates to the real world?*

You know your child better than anyone. You will be able to tell if she or he is benefiting from the instruction and understanding the content of the material by the way they answer you. Speak to your child's teacher if you suspect there is a problem.

### ***Ask your child about his assignments***

*What is the required work? Has he finished the work on time? Is he having difficulty? If he is having difficulty, why?*

Encourage your child to talk to her teachers if she is having difficulty understanding a concept or completing an assignment. If your child continues to experience difficulty, speak to the teacher yourself so that the two of you can work together to support your child.

Even if you do not understand the content that your child is learning, the fact that you are showing interest in his or her school work and believe that it is important that he or she does well sends a powerful message.

**Sharon Contreras**  
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## SEMESTER A

### Content students will be learning

### Essential questions students should be able to answer by end of unit

#### Unit A.1 - Motion (5 days)

- Measure distance and time for a moving object.
- Explain an object's motion in terms of its change in position.
- Calculate distance and time and graphically represent the data.

- » What is the relationship between position and motion?
- » How can you describe an object's motion in terms of a change of position?

#### Unit A.2 - Calculating Speed (5 days)

- Understand how to calculate speed by using measurements for distance and time.
- Solve an equation for speed given the other two variables.
- Differentiate among speed, velocity, and acceleration.

- » How can you explain speed in terms of distance and time?
- » What types of forces cause a change in the direction or speed of an object?

#### Unit A.3 - Analyzing Speed (5 days)

- Acquire distance and time data to determine speed.
- Solve for an unknown in the expression for speed given values for the other two variables.
- Calculate speed and graphically represent the data.
- Analyze and represent speed to solve problems.

- » Explain speed in terms of distance and time.
- » Explain how to use a graph to determine an object's speed.

#### Unit A.4 - Analyzing Motion (6 days)

- Understand the difference between speed, velocity, and acceleration.
- Graphically represent motion events.
- Represent complex motion events

- » How can you graphically represent complex motion events?
- » What is the difference between displacement and distance?

#### Unit A.5 - Acceleration (7 days)

- Measure distance and time for a moving object.
- Understand that the acceleration of an object is proportional to the force on the object.
- Identify and interpret graphs to explain accelerating motion.

- » How do you determine acceleration?
- » What is the difference between constant velocity and acceleration?

#### Unit A.6 - Relationship Between Force and Motion (4 days)

- Understand how unbalanced forces act on the speed or direction of the motion of an object.
- Explain why the acceleration of an object is proportional to the force on the object.
- Understand the difference between mass and weight.

- » What is the relationship between force and motion?
- » What is the effect of unbalanced forces on the direction of motion?

## SEMESTER A (CONTINUED)

### Content students will be learning

### Essential questions students should be able to answer by end of unit

#### Unit A.7 - Gravity (5 days)

- Understand how unbalanced forces act on the speed or direction of motion of an object.
- Explain why the acceleration of an object is proportional to the force on the object.
- Understand gravity as a universal force of attraction between masses.

- » Why is acceleration proportional to force on an object?
- » How can you explain gravity as a universal force of attraction between masses?
- » Discuss Galileo's discovery of acceleration.

#### Unit A.8 - Momentum (5 days)

- Understand how unbalanced forces act on objects.
- Make predictions about how unbalanced forces change the speed of objects.
- Understand why unbalanced forces affect the direction of motion.

- » How can you explain the interplay of force and time (impulse) and momentum in crashes?
- » What causes damage to falling objects?

## SEMESTER B

### Content students will be learning

### Essential questions students should be able to answer by end of unit

#### Unit B.1 - Characteristics of Organisms (4 days)

- Observe, describe, and chart growth and motion of living organisms.
- Describe the characteristics of living organisms.
- Describe the characteristics of nonliving objects.

- » What are the characteristics of living organisms?
- » What are the characteristics of nonliving objects?
- » What are characteristics that some nonliving objects share with living organisms?

#### Unit B.2 - Scientific Tools: Microscopes (4 days)

- Understand that organisms have identifiable structures.
- Observe individual cells through a microscope.
- Investigate individual cells targeting the cell membrane and nucleus.

- » What are the identifiable structures of a cell as seen through a microscope?
- » What is the function of the cell membrane?
- » Describe the nucleus of the cell.

#### Unit B.3 - Microscopic Organisms (5 days)

- Observe and describe the cells in an organism.
- Compare and contrast individual cells of organisms and recognize their similarities.
- Understand how cells work together to perform specific functions.
- Describe the motions and responses of living organisms.
- Understand that cells are living organisms.

- » What are the characteristics of living organisms?
- » What is the relationship between the structure and function of cells?
- » How are single-celled organisms like multicellular organisms?
- » How do the structures of single-celled organisms function like those of multicellular organisms?

#### Unit B.4 - Human Cells (5 days)

- Explain how individual cells have the same survival needs as an organism.
- Describe how different organisms have mechanisms that work in a coordinated way.

- » What functions do cells share with one another?
- » What are the survival needs of a cell and how do they compare to those of an organism?

#### Unit B.5 - Cycle of Plants (4 days)

- Observe, describe, and chart the growth of living organisms.
- Describe why a cell has the same survival needs as an organism.
- Understand that organisms (plants and animals) contain structures that allow them to grow.

- » What characteristics of seeds indicate they are living?
- » Why is it essential for organisms to contain structures for growth and reproduction??

## SEMESTER B (CONTINUED)

### Content students will be learning

### Essential questions students should be able to answer by end of unit

#### Unit B.6 - Process of Transpiration (5 days)

- Explain that specialized cells perform specialized functions.
- Compare individual cells of tissues and recognize the similarities of cells.
- Explain how each type of cell, tissue, and organ has a distinct structure and set of functions.

- » How do specialized cells perform specialized functions?
- » What are basic similarities in the structures of plant leaf cells?
- » What is the function of transpiration?

#### Unit B.7 - Plant Reproduction (4 days)

- Describe reproduction as a process that combines the genetic material of two parents to produce a new organism.
- Describe the reproductive structures of plants.
- Explain how different structures and characteristics contribute to an organism's survival.

- » Describe the function of the reproductive structures of plants.
- » Explain how an offspring possesses the same characteristics as parents.

#### Unit B.8 - Adaptations of Organisms (6 days)

- Explain that specialized cells have specialized functions.
- Understand that organisms exhibit adaptations that enhance their chances to survive and reproduce in an ecosystem.
- Describe how each type of cell, tissue, and organ can have a distinct structure and set of functions.

- » What is the relationship between the adaptations of populations of organisms and their habitats?
- » What structures do most organisms have in common?

#### Unit B.9 - Classification of Organisms (6 days)

- Explain the growth patterns of a living organism.
- Understand how a classification system can be used to interpret possible relationships among groups of organisms.
- Understand the structures and characteristics of an organism's internal structures.

- » How do the internal structures of an organism aid its survival?
- » What classification system is used to group organisms?
- » What are some noticeable characteristics of an organism?



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