

**Table 1. South Cross Bayou Middle School (Grades 6 through 8) Science Standards by Station <sup>[a]</sup>**

Station	Number	Description
Introduction	SC.7.E.6.6	Identify impacts humans have had on Earth, including deforestation, urbanization, desertification, erosion, air and water quality, and water flow changes.
	SC.8.N.4.1	Explain science is one process to inform decision-making at community, state, national, and international levels.
	SC.8.N.4.2	Explain how political, social, and economic concerns can affect science and vice versa.
1 Operations Room/SCADA	SC.6.CS.1.7	Explain proper use and operation of security technologies.
	SC.7.CS.2.1	Identify need for security safeguards on personal devices.
	SC.8.CS.1.1	Analyze threats and vulnerabilities to information security for individuals and organizations.
	SC.8.E.5.10	Assess how technology is essential to science for access to outer space and other remote locations, sample collection, measurement, data collection and storage, computation, and communication of information.
2 Laboratory	SC.7.E.6.6	Identify impacts humans have had on Earth, including deforestation, urbanization, desertification, erosion air and water quality, water flow changes.
	SC.7.PE.3.3	Use modeling and simulations to test scientific hypothesis.
	SC.8.PE.2.3	Use data from simulations to test hypothesis.
3 Influent Pump Station	SC.7.E.6.6	Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion air and water quality, changing the flow of water.
4 Headworks/ Grit Removal	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
5 Primary Clarifier Tanks	SC.8.P.8.4	Classify and compare substances based on characteristic physical properties that can be demonstrated or measured, including density, thermal or electrical conductivity, solubility, magnetic properties, and melting and boiling points, and explain these properties are independent of the sample amount.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
6 Anoxic Tanks	SC.6.E.7.4	Differentiate and show interactions among geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.
	SC.6.L.14.3	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.
	SC.7.L.17.1	Explain and illustrate roles of and relationships among producers, consumers, and decomposers in a food web's energy transfer process.
	SC.8.L.18.2	Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.
	SC.8.L.18.4	Cite evidence that living systems follow the laws of conservation of mass and energy.

Station	Number	Description
7 Aeration Tanks	SC.6.L.14.3	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.
	SC.7.L.17.1	Explain and illustrate roles of and relationships among producers, consumers, and decomposers in a food web's energy transfer process.
	SC.8.L.18.2	Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.
	SC.8.L.18.4	Cite evidence that living systems follow the laws of conservation of mass and energy.
	SC.8.P.8.4	Classify and compare substances based on characteristic physical properties that can be demonstrated or measured, including density, thermal or electrical conductivity, solubility, magnetic properties, and melting and boiling points, and explain these properties are independent of the sample amount.
	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
8A Mixing Stations/ Return-Activated Pumps	SC.8.P.8.4	Classify and compare substances based on characteristic physical properties that can be demonstrated or measured, including density, thermal or electrical conductivity, solubility, magnetic properties, and melting and boiling points, and explain these properties are independent of the sample amount.
	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
8B Secondary Clarifier Tanks	SC.8.P.8.3	Explore and describe the densities of various materials through measurement of their masses and volumes.
	SC.8.P.8.4	Classify and compare substances based on characteristic physical properties that can be demonstrated or measured, including density, thermal or electrical conductivity, solubility, magnetic properties, and melting and boiling points, and explain these properties are independent of the sample amount.
	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
9 Denitrification Filters	SC.6.E.7.4	Differentiate and show interactions among geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.
	SC.6.L.14.3	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing. and releases carbon dioxide.
	SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, but only changed from one form to another.
	SC.8.L.18.2	Describe and investigate how cellular respiration breaks down food to provide energy.
	SC.8.P.9.2	Differentiate between physical and chemical changes.

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Station	Number	Description
10 Chlorine Contact Chambers	SC.6.P.13.3	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.
	SC.7.E.6.6	Identify impacts humans have had on Earth, including deforestation, urbanization, desertification, erosion air and water quality, changing the flow of water.
	SC.7.L.15.3	Explore scientific theory of evolution by relating how a species' inability to adapt within a changing environment may contribute to the species' extinction.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
11 Outflow Cascade	SC.6.P.13.1	Investigate and describe types of forces, including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.
	SC.7.E.6.6	Identify impacts humans have had on Earth, including deforestation, urbanization, desertification, erosion, air and water quality, and water flow changes.
	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
	SC.8.P.9.2	Differentiate between physical and chemical changes.
12 Waste Sludge Holding Tank	SC.8.P.8.9	Distinguish among mixtures, including solutions, and pure substances.
13A Egg-Shaped Digesters	SC.6.E.7.4	Differentiate and show interactions among geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.
	SC.6.L.14.3	Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.
	SC.7.L.17.1	Explain and illustrate roles of and relationships among producers, consumers, and decomposers in a food web's energy transfer process.
	SC.8.L.18.2	Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.
13B Pelletizer	SC.7.P.11.1	Recognize adding heat to or removing heat from a system may result in a temperature change and potential change of state.
	SC.8.N.4.2	Explain how political, social, and economic concerns can affect science and vice versa.
	SC.8.P.9.3	Investigate and describe how temperature influences chemical changes.

<sup>[a]</sup> Possible connections science standards are listed in Table 2. South Cross Bayou Middle School (Grades 6 through 8) Science Standard Potential Connection by Station.

SCADA = supervisory control and data acquisition

**Table 2. South Cross Bayou Middle School (Grades 6 through 8) Science Standard Potential Connection by Station**

Station	Number	Description
Introduction	Not applicable	Not applicable
1 Operations SCADA	SC.8.CS.2.2	Describe security and privacy issues that relate to computer networks.
	SC.8.CS.3.2	Discuss need of immediate security updates for a program.
	SC.7.N.3.2	Identify benefits and limitations of use of scientific models.
2 Laboratory	Not applicable	Not applicable
3 Influent Pump Station	SC.6.P.13.1	Investigate and describe types of forces, including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.
4 Headworks/ Grit Removal	SC.8.P.9.2	Differentiate between physical and chemical changes.
5 Primary Clarifier Tanks	SC.8.P.9.1	Explore the law of conservation of mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.
6 Anoxic Tanks	SC.7.L.15.2	Explore scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.
	SC.7.L.15.3	Explore scientific theory of evolution by relating how a species' inability to adapt within a changing environment may contribute to the species' extinction.
7 Aeration Tanks	SC.7.L.15.2	Explore scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.
	SC.7.L.15.3	Explore scientific theory of evolution by relating how a species' inability to adapt within a changing environment may contribute to the species' extinction.
8A Mixing Stations/ Return-Activated Pumps	Not applicable	Not applicable
8B Secondary Clarifier Tanks	Not applicable	Not applicable
9 Denitrification Filters	Not applicable	Not applicable

Pinellas County South Cross Bayou Middle School Standards by Station

Station	Number	Description
10 Chlorine Contact Chamber	Not applicable	Not applicable
11 Outflow Cascade	Not applicable	Not applicable
12 Waste Sludge Holding Tank	SC.8.P.9.2	Differentiate between physical and chemical changes.
13A Egg Shaped Digesters	SC.8.L.18.3	Construct carbon cycle scientific model to show how matter and energy are continuously transferred within and between organisms and their physical environment.
	SC.8.P.9.3	Investigate and describe how temperature influences chemical changes.
13B Pelletizer	Not applicable	Not applicable

SCADA = supervisory control and data acquisition