ACTIVE SCIENCE CURRICULUM MAP
3rd-5th Grade

LESSON # and TITLE	DESCRIPTION	LEVELS	COMMON CORE STANDARDS	LEARNING OBJECTIVES	ASSESSMENT
1. Exploring Science	Introduces the series of steps used to explore science, such as making a hypothesis, collecting data, analyzing results; and drawing conclusions.	12	MA Science Standards Grades 3-5: Inquiry "(Students begin) *Formulating a hypothesis, planning the steps of an experiment and determining the most objective way to test the hypothesis… incorporating mathematical skills of measuring and graphing to communicate findings*" (p.10)	Students should be able to identify key terms, analyze data and answer fundamental questions regarding the scientific method	
2. Fitness Frenzy	Introduces concepts of physical fitness, including aerobic endurance, muscle flexibility, muscular strength, speed of movement, power and hydration	8	MA Health Standards Fitness "*Students will, by repeated practice, utilize principles of training and conditioning, will learn biomechanics and exercise physiology, and will apply the concept of wellness to their lives*." (p. 4)	Students should be able to identify key terms, analyze data and answer fundamental questions regarding fitness	
3. Calorie Countdown	Introduces calories through the exploration of energy, calories burned, daily averages, empty calories, and portion sizes	10	MA Health Standards (K-5) Nutrition *"Students will gain the knowledge and skills to select a diet that supports health and reduces the risk of illness and future chronic*	Students should be able to identify key terms, analyze data and answer fundamental questions regarding calories and healthy eating	

			diseases." (p.4)		
4. Beat-by-Beat	Introduces students to functions of the heart with a focus on the relationships between heart rate, blood pressure and benefits of exercise	6	MA Health Standards (K-5) Body Systems "*Name the external and internal parts of the body and the body systems (nervous, muscular, skeletal, circulatory, respiratory, digestive, endocrine, and excretory systems).* (p. 21)	Students should be able to identify key terms, analyze data and answer fundamental questions regarding the heart and its functions	
5. Energy Balance	Introduces the concept of energy balance and its role in maintaining a healthy lifestyle through proper eating habits and frequent exercise	8	MA Health Standards (K-5) Fitness "*Identify the major behaviors that contribute to wellness (exercise, nutrition, hygiene, rest, and recreation) (p. 24)*	Students should be able to identify key terms, analyze data and answer fundamental questions regarding energy balance	
6. Rethink Your Drink	Introduces students to the idea of healthy drinking habits by focusing on the amount of sugar and calories in popular beverages	6	MA Health Standards (K-5) Nutrition *"Students will gain the knowledge and skills to select a diet that supports health and reduces the risk of illness and future chronic diseases." (p.4)*	Students should be able to identify key terms, analyze data and answer fundamental questions regarding calories, sugars and healthy drinking habits	
7. Sports Science I	Introduces concepts of sports sciences including speed, velocity and momentum	8	MA Science Standards (6-8) Motion of Objects *"Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed." (p. 68)*	Students should be able to identify key terms, analyze data and answer fundamental questions regarding, speed, velocity and momentum	

8. Sports Science II					
9. Math Movers					
10. Fast Food	Introduces students to healthy eating habits by focusing on fats (good and bad), calories and fast food choices	6	MA Health Standards (K-5) Nutrition *"Students will gain the knowledge and skills to select a diet that supports health and reduces the risk of illness and future chronic diseases." (p.4)*	Students should be able to identify key terms, analyze data and answer fundamental questions regarding fats, calories and fast food	

LESSON DESCRIPTIONS

Lesson 1: Exploring Science (12 Data Driven, 0 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	FEATURES	DATA (ANALYSIS)	QUESTION OF DAY
1 (D)	To learn what a Hypothesis is.	How many steps do you think you will take while playing for the next 30 minutes?	Hypothesis	Uses steps from any activity	Bar chart of predicted vs. actual steps	In the scientific method, you first ask a question or make a guess about what you think will happen. What is this called?
2 (D)	To remind students what a hypothesis is	Do you hypothesize that you will take more or less steps than your friend during today's activity?	Hypothesis	Uses steps from any activity; work in pairs to compare steps	Bar chart of steps obtained from friend vs. self	If you walked 1 mile, about how many steps would you take?
3 (D)	To learn how to collect and record data	How many steps do you think you will take while playing for the next 30 minutes?	Hypothesis, Collecting Data, Recording Data, Pedometer	Use steps from any activity	Bar chart of predicted vs. actual steps	Place the steps of the scientific method in order? What device collected your steps? In science we collect _____?
4 (D)	To remind students about data	Do you hypothesize that you will take more or less steps than your friend during today's activity?	Hypothesis, Data, pedometer	Uses steps from any activity; work in pairs to compare steps	Bar chart of steps obtained from friend vs. self	Today you collected ____ on you and your friend to see if your hypothesis was correct about how many steps you took?
5 (D)	To learn about analyzing data	Did you take more or less steps today than you did last time at Active Science?	Analyzing data, hypothesis	Use steps from any activity	Bar chart of previous days steps vs. actual days steps	What day did you take the most steps? In Science you make a hypothesis, collect information, record the data, then you_____?
6 (D)	To remind students how to analyze and introduce bar graph	Do you hypothesize that you will take more or less steps than two of your friends during today's activity?	Analyzing data, hypothesis, bar graph	Uses steps from any activity; work in groups of 3 to compare steps	Bar chart of steps obtained from friends vs. self	Who took the most steps? You analyzed your data using a _____?
7 (D)	To learn how to make a conclusion	How many miles will you travel while playing for the next 30 minutes?	Conclusion, Hypothesis	Uses steps from last 4 activities	Bar chart of steps obtained from last 4 days	Which day did you travel the furthest? What was your conclusion by looking at the bar graph?

8 (D)	To remind students how to make a conclusion	Hypothesis who will travel the shortest distance during your activity between you and 2 friends	Conclusion, Hypothesis	Uses steps from any activity; work in groups of 3 to compare steps	Bar chart of steps obtained from friends vs. self	Who traveled the shortest distance? Place the steps of the scientific method in order.
9 (D)	To learn how to analyze using a data table	Do you think you will travel more or less miles today than you did on Day 8? (Day 8 total)	Data table, Hypothesis	Uses miles traveled from previous days totals	Data Table comparing previous days distance traveled totals	In the past 6 days, what day did you travel the furthest? You can use a data_____ and graphs to help analyze data?
10 (D)	To remind students how to use a data table	Hypothesis who will travel the farthest distance during your activity between you and 2 friends	Data table, Hypothesis	Uses distance traveled from any activity; work in groups of 3 to compare distance traveled	Data Table comparing distance traveled of self vs. friends	Who traveled the shortest distance? After you collect data, where do you record it?
11 (D)	To analyze data using a line graph	What day do you think you traveled the farthest in levels 1-11?	Line Graph, Hypothesis	Uses distance traveled from all previous activities	Line graph of mileage obtained from all previous day's activity	What level did you travel the farthest? Why do you think you traveled the farthest on that day?
12 (D)	To remind students how to analyze data using a line graph	How many total miles do you think you traveled during your 12 levels?	Line Graph, Hypothesis	Uses distance traveled from all previous activities	Line graph of mileage obtained from all previous day's activity	How many total miles did you travel during the 12 lessons? Place the steps of the scientific method in order.

Lesson 2: Fitness Frenzy (3 Data Driven, 5 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	ACTVITY	DATA (ANALYSIS)	QUESTION OF DAY
1 (D)	To learn about physical fitness	How many steps should you take every single day?	Physical fitness, Hypothesis	Any (Steps)	Bar chart of predicted vs. actual steps	What is the ability to be both healthy and meet physical challenges in your life?
2 (D)	To learn about the importance of staying physically fit	Do you think you took more steps today during your activity than you do when you play video games?	Physical fitness Hypothesis,	Any (Steps)	Bar chart of steps for Active Science vs. Video Games	What was the best way to stay physically fit and be healthy? (3 options)
3 (D)	To learn about aerobic endurance	Pick a friend and choose who you think took more steps and had higher aerobic endurance today (me/my friend)	Aerobic endurance, Hypothesis	Any (Steps) Work in pairs	Bar chart of steps obtained from student vs. friend	Do you think doing 15 minutes of physical activity requires more or less endurance than 30 minutes of activity?
4 (T)	To learn about muscle flexibility	Which of these three people is the most flexible? (Gymnast, couch potato, older person)	Muscle flexibility, Hypothesis	Any	Feedback about correct answer	_____is the amount which you can move your muscles? (Identify key term)
5 (T)	To learn about muscular strength	Which of these athletes has greater muscular strength?	Muscular strength, Hypothesis	Any	Feedback about correct answer	True or False, it takes more muscular strength to lift a 10 pound object than to lift 20 pound object?
6 (T)	To learn about speed of movement	Which of these three choices shown here can reach the highest speed? (cheetah, sprinter, race horse)	Speed, Hypothesis	Any	Data table representing the three options and the correct answer	_____ in fitness is the ability to cover a distance as fast as possible? (Identify key term)
7 (T)	To learn about power	Which of these three people has the most power? (football lineman, soccer player, ping pong player)	Power, Hypothesis	Any	Feedback about correct answer	_____ is the combination of strength and speed? (Identify key term)
8 (T)	To learn about hydration	How much water do you need each day? (1 glass, 4 glasses, 8 glasses)	Hydration, Hypothesis	Any	Data table representing the three options and the correct answer	_____ is the process which supplies water to a person through fluids (Identify key term)

Lesson 3: Calorie Countdown (5 Data Driven, 5 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn about calories	Which food pictured has the most calories? (Slice of pizza, an apple, a cupcake)	Calories, Hypothesis	Any	Data table representing the three options and the correct answer	What do calories supply our body with? (4 options)
2 (D)	To learn about energy/calories that we use while doing different activities	How many calories do you think you burned during your activity today?	Calories, Energy, Hypothesis	Any (Calories)	Bar chart of predicted vs. actual calories	What is the best way to burn or use more calories? (3 options)
3 (T)	To learn how many calories are in some foods	Which lunch has the most calories? (3 options)	Calories, Hypothesis	Any	Data table representing the three options and the correct answer	Replacing a sundae with a piece of fruit will lower your lunches 'calories, True or False?
4 (D)	To compare the calories students burned last time to today's activity	Which day do you think you burned the most calories? (today/last time)	Bar graph, calories, Hypothesis	Any (Calories) compare to previous day's total	Bar chart comparing last time vs. today's calories	The reason you burned more calories on these days was because you _____? (3 options)
5 (T)	To learn how many calories students should take from the types of foods you eat	How many calories do you think you should take in from food each day?	Calories, Hypothesis	Any	Data table representing the correct answer based on age and gender	What foods are best for good health? (3 options)
6 (D)	To analyze the calories students burned last time to today's activity	Which day do you think you burned the most calories? (today/last time)	Line graph, calories, Hypothesis	Any (Calories) compare to previous day's total	Line graph comparing last time vs. today's calories	Eating a lot from unhealthy foods can make you gain unhealthy weight, True or False?
7 (T)	To learn about empty calories	Which of these three foods is highest in empty calories? (cake, chicken wing, glass of milk)	Empty calories, Hypothesis	Any	Data table representing the three options and the correct answer	What do we call food containing no nutrients and plenty of added sugars or fats? (Identify key term)
8 (D)	To compare who burned more calories between a student and a friend	Who burned more calories during today's activity? (More/Less)	Calories, Hypothesis	Any (Calories) work in pairs and compare	Bar chart of calories obtained from friend vs. self	Exercise is a great way to burn calories and be healthy, True or False?
9 (T)	To learn about portion size	Which of these popcorns is the largest? (Two options)	Portion size, Calories, Hypothesis	Any	Data table representing the two options and the correct answer	_____ is the amount of food you choose to eat at one time (Identify key term)
10 (D)	To compare calories students burned over	Do you think that the calories you burned during	Calories, Hypothesis	Any (Calories) use calories	Line graph comparing each of the different days of activity	How many calories do you think you would burn if you

	the course of the entire lesson	the different levels were either all the same or different each time?		from all previous activities		were active for an extra 30 minutes every day? (3 options)

Lesson 4: Beat by Beat (0 Data Driven, 6 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn about your heart	About how much blood do you think your heart pumps per minute? (1 liter bottle, 2 liter bottle, 5 liter bottle)	Heart, Hypothesis,	Any	N/A	Your heart pumps ____throughout the body (4 options)
2 (T)	To learn about heart rate	How many times do you think your heart should beat in 1 minute while seated?	Heart rate, Heart, Hypothesis	Any	Data table representing the correct answer based on age	Your heart rate would be expected to ____ during exercise? (3 options)
3 (T)	To learn about blood	Does your body need to pump more or less blood when exercising? (More or Less)	Blood, Heart, Pump, Hypothesis	Any	Bar chart comparing the two options	When you play basketball, your heart begins pumping _____ blood to your muscles? (More or Less)
4 (T)	To learn about blood pressure	During exercise, do you think your blood pressure increases or decreases?	Blood pressure, Blood, Hypothesis	Any	Bar chart comparing the two options	_____pressure increases during exercise to push blood to your working muscles? (Identify key term)
5 (T)	To learn about heart rate during exercise	Do you think your heart rate increased or stayed the same during your activity?	Heart rate, hypothesis	Any (heart rate)	Bar chart comparing the two options	Your heart rate would be highest during_____? (3 options)
6 (T)	To learn why it is important to have a healthy heart	Which of these activities are good ways to keep your heart healthy? (Eat fast-food, exercise daily, eat a healthy diet, drink lots of water)	Heart health, Heart, Blood, Hypothesis	Any	Feedback about correct answer(s)	In order to have a healthy heart, you should exercise; eat lots of fruits and vegetables and drink_____ every day? (4 options)

Lesson 5: Energy Balance (2 Data Driven, 6 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn about energy used as fuel for the body during activities	Which of these activities require the most energy? (Hiking, walking, sleeping)	Energy, Hypothesis	Any	Feedback about correct answer (Ranking system)	_____ is used by our bodies to do work, to play or be active? (Identify key term)
2 (T)	To learn about energy balance	What happens when you eat more calories than you use during an activity? (gain weight/lose weight)	Energy balance, Calories, Hypothesis	Any	Data table representing the correct answer	_____is keeping the calories we eat about the same as calories we burn? (Identify key term)
3 (T)	To reinforce the concept of energy balance	Which of these activities will burn the most calories in 30 minutes? (walking, reading, swimming, playing the piano)	Energy, Calories, Energy balance, Hypothesis	Any	Data table representing the correct answer	The more difficult the activity that you do, the _____calories (Energy) you will burn? (more, less, same)
4 (T)	To learn how energy balance contributes to a healthy lifestyle	What activity would you have to do to burn off a 100 calorie cookie? (30 mins of walking or 30 mins of bicycling)	Energy, Energy balance, Calories, Hypothesis	Any	Bar chart comparing the two options	If you eat foods that are high in calories, you need to do ____ physical activity to keep your energy balanced? (more, less, same)
5 (T)	To learn more about energy balance	About how many calories in are in a slice of pizza? (3 options)	Energy, Energy balance, Calories, Hypothesis	Any	Data table representing the three options and the correct answer	The more calories you eat, the more active you should be to balance those calories and keep your body weight healthy, True or False?
6 (T)	To learn how to make healthier food choices based on the energy (calories) in food	Which food would be equal to burning 100 calories used? (A cheeseburger, a pizza, one banana)	Energy, Energy balance, Calories, Hypothesis	Any	Data table representing the three options and the correct answer	If you burned 100 calories playing on the playground, which of the following foods would equal to this amount of calories? (2 options)
7 (D)	To compare who burned more calories between a student and a friend	Who burned more calories during today's activity? (More/Less)	Calories, Hypothesis	Any (Calories) work in pairs and compare	Bar chart of calories obtained from friend vs. self	Exercise is a great way to burn calories and balance the calories you eat, True or False?
8 (D)	To learn how aerobic exercise helps balance calories and keep a healthy weight	Which of your two friends do you think burned more calories during today's aerobic exercise	Aerobic exercise, Calories, Hypothesis	Any (Calories) Work in groups of 3	Bar chart of calories obtained from friend vs. friend	Dancing is a great way to burn_____ and stay fit? (2 options)

Lesson 6: Rethink Your Drink (2 Data Driven, 4 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn about sugar in drinks	Which of these drinks has the MOST amount of sugar? (water, cola, Gatorade)	Sugar sweetened drinks, Hypothesis	Any	Data table representing the three options and the correct answer	_____ are unhealthy because they have lots of calories and can cause you to gain weight? (Identify key term)
2 (T)	To learn about the connection between sugar sweetened beverages and the calories in them	Which one of these drinks has the highest number of calories? (water, cola, Gatorade	Sugar sweetened drinks, Calories Hypothesis	Any	Bar chart comparing the three options	When you look at a drink and you see that it has a high number of calories, this will often mean that it will have _____ sugar (3 options)
3 (D)	To learn how the calories in sugar sweetened beverages are related to physical activity	During the activity did you exercise hard enough to burn off 150 calories from a can of soda? (Yes or No)	Sugar sweetened drinks, Calories, Physical activity Hypothesis	Any (Calories)	Bar chart comparing a can of soda to the student's calories burned that day	In order to burn off the calories from 2 cans of soda, do you think you need to do more or less than 30 minutes of physical activity per day? (more or less)
4 (D)	To learn how the calories in sugar sweetened beverages are related to the steps taken	During the activity did you take enough steps to burn off 150 calories from a can of soda? (Yes or No)	Sugar sweetened drinks, Calories, Physical activity Hypothesis	Any (Steps)	Bar chart of predicted vs. actual steps	**In order to burn 300 calories from a slice of pizza, you would have to take _____ steps? (3 options)
5 (T)	To learn how much sugar is in popular drinks	How many teaspoons are in a can of Mountain Dew Soda? (3 options)	Teaspoon, Sugar sweetened drinks, Hypothesis	Any	Data table representing the three options and the correct answer	Non-diet soda has lots of sugar and therefore, is high in calories, True or False?
6 (T)	To learn about the sugar in sports drinks	How many calories are in a sports drink? (3 options)	Sugar sweetened drinks, Calories Hypothesis	Any	Data table representing the three options and the correct answer	There are at least _____ teaspoons in a can of soda? (3 options)

Lesson 7: Sports Science I (0 Data Driven, 8 Theoretical)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn how to determine the speed of movement	Do you think your speed will be faster if you traveled 1 mile in 30 minutes or 1 mile in 15 minutes? (2 options)	Speed of movement, Hypothesis	Any	Feedback about correct answer	Speed is calculated by dividing the ____ you travel by how long it takes to get there? (3 options)
2 (T)	To review how to determine speed of movement	Who will have a faster speed, your friend who walked 3 miles in 60 minutes or you, who traveled 6 miles in 60 minutes	Speed of movement, Hypothesis	Any	Bar chart comparing the two options	Speed is often measured in ____? (3 options)
3 (T)	To learn about velocity	Which train traveled at the highest velocity? (3 options)	Velocity, Direction, Hypothesis	Any	Data table representing the three options and the correct answer	_____is speed moving in a direction? (Identify key term)
4 (T)	To review velocity of movement	Who will have a faster pitching velocity is baseball, your friend who throws 40 mph or you, throwing 50 mph	Velocity, Direction, Hypothesis	Any	Bar chart comparing the two options	A hiker traveled on a trail 10 miles North in 2 hours, what was his velocity? (3 options)
5 (T)	To learn how to calculate speed and velocity	If you travel 2 miles on a bicycle in 30 minutes your speed will be faster/slower/same as if you ran 2 miles in 30 minutes	Velocity, Direction, Speed, Hypothesis	Any	Bar chart comparing the two options	A runner traveled 5 miles North in 1 hour, what was his speed or velocity? (3 options)
6 (T)	To review how to calculate speed and velocity	If you jog to your school located 1 mile away at a speed of 4 mph would you get there in less than an hour? (Yes or No)	Velocity, Direction, Speed, Hypothesis	Any	Feedback about correct answer	A race car travels 100 miles in 1 hour, what was his speed or velocity? (3 options)
7 (T)	To learn about momentum	If a 2000 lb car and a 180 pound man riding a bicycle are each traveling 20 mph, which do you think has the greater momentum (2 options)	Momentum, Hypothesis	Any	Data table representing the two options and the correct answer	____is made up of an object's mass (weight) multiplied by its speed? (Identify key term)

8 (T)	To review momentum	A 120 lb boy is running 4 mph and a 120 lb girl is running 5 mph, who do you think has more momentum? (2 options)	Momentum, Hypothesis	Any	Feedback about correct answer	Momentum is made up of an object's mass (weight) multiplied by how ____ it's moving? (3 options)

Lesson 10: Fast Food (1 Data Driven, 4 Theoretical, 1 Incomplete)

LEVEL	PURPOSE	HYPOTHESIS	KEY WORDS	Activity	DATA (ANALYSIS)	QUESTION OF DAY
1 (T)	To learn about the fat we find in fast food restaurants	Which of these fast food options has the MOST amount of fat in it? (large fry, quarter pounder w/cheese, 10 piece nuggets)	Fat, Hypothesis	Any	Data table representing the three options and the correct answer	When you are eating at a fast food restaurant, you should try to avoid foods that have too much unhealthy _____? (3 options)
2 (T)	To learn about the connection between the fat and calories that we find in fast food	How long (minutes) will you have to run in order to burn off a 550 calorie Big Mac?	Fat, Calories, Hypothesis	Any	Bar chart of predicted vs. actual minutes	If you ate an order of large fries (500 cals) and a Big Mac (550 cals) , how long would you have to run in order to burn this off? (3 options)
3 (T)	To learn about the differences between bad fat and good fat	Which type of food would contain good fat and be good for your heart? (Salmon, cheeseburger, ice cream)	Fat: good/bad, Hypothesis	Any	N/A (Data table representing the three options and the correct answer)	N/A
4 (D)	To learn how calories in fast food are related to steps taken	Do you think you and your friend took enough steps during today's activity to burn off a small order of fries? (Yes or No)	Calories, Hypothesis	Any (Steps)	Bar chart of steps needed for large fry vs. actual	In order to burn 750 calories from a Burger King Whopper w/cheese, you would have to take ____ steps (3 options)
5 (T)	To learn how to make better choices at fast food restaurants	How many calories do you think someone eats during a meal at a fast food restaurant? (3 options)	Calories, Hypothesis	Any	Data table representing the three options and the correct answer	How many days of exercise during Active Science would it take to burn off a 1,200 calorie meal from McDonalds? (3 options)
6	N/A	N/A	N/A	N/A	N/A	N/A