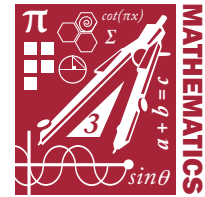


# EVERYBODY ON THE MOVE!



This guide links the *Everybody on the Move!* unit to the Texas Essential Knowledge and Skills (TEKS) for Mathematics and Health Education for second graders. *Everybody on the Move!* is a mathematics unit that allows students to study physical fitness patterns in their daily routines. *Everybody on the Move!* also has interdisciplinary connections to English Language Arts, Social Studies, and Science disciplines. For example, students will conduct research and compose a variety of texts, as outlined in the English Language Arts and Reading TEKS, develop concepts of time and chronology, as described in the Social Studies TEKS, and develop inquiry and informed decision-making processes as outlined in the Science TEKS. The following document includes the applicable TEKS and the details of the *Everybody on the Move!* unit. The final section of this document presents the applicable Texas College and Career Readiness Standards adopted by the Texas Higher Education Coordinating Board (THECB) on January 24, 2008.

## Description of Unit

In this task, students explore daily activities and their impacts on physical fitness. Students use mathematics skills such as measurement, counting, addition, contextual multiplication, data analysis and graphing to identify areas for change in their personal lives. Students gain awareness about the role of exercise in maintaining health and learn about initiatives such as the President's Active Lifestyle Challenge (PALA+) and what each individual can do to support healthy choices. Student learning culminates in the design of an intervention aimed at increasing physical activity. These interventions could be one of the following products:

- a new physical fitness plan and accompanying marketing kit,
- an original game or sport,
- an invention that creates a new piece of physical fitness equipment or significantly builds on an existing device, or
- a new mode of personal transportation that increases the user's physical activity on a daily basis.

### *Everybody on the Move!* (Grade 2)

## Goals

Students will meet these goals in their explorations:

- Become familiar with using mathematics to describe measurements of distance, time, and quantities
- Use mathematics to model a real world situation
- Gain awareness of the impact that physical fitness has on a healthy lifestyle
- Question current choices and outcomes
- Generate new ideas for increasing physical activity
- Develop basic data analysis skills such as creating a graph or chart of up to four categories of data
- Develop communication skills, creative problem solving skills, and logical thinking skills
- Understand the potential risks involved with physical fitness plans, activities, and devices and take precautions to ensure the safety of self and others

## Phase I. Learning Experiences

1. Introduce students to how mathematics can be used as a tool to describe distances, times, units of measure, and quantities. In small groups, ask students to measure their smallest unit of regular forward movement (e.g., their strides) using standard units of measure. Write down that number at the top of the attached Data Collection Sheet.
2. Ask students to brainstorm alternate units for measuring the distance (e.g. number of bottle caps, number of footballs). Lead the class in a discussion on how standard units of measure help to clarify communication and review units for distances such as centimeters, meters, kilometers, inches, feet, yards, and miles. Also review units of measurement for time such as seconds, hours, and minutes.
3. Post a large number line at the front of the room. Divide students into three groups: A, B, and C. Ask Group A to move from one corner of the classroom to the other, counting paces. Plot the numbers along the number line in one color of marker. Ask group B to move halfway across the room and plot their paces. Ask group C to move all the way across the room and then move back halfway and plot their paces. Question students on how each groups' numbers are related and how we might predict what would happen if group C finished moving the rest of the length of the room? How might students explain mathematically what is happening to the numbers? For instance, why do the numbers continue to increase, even when a group moves backwards across the space?
4. Introduce students to technological devices used to track distances such as pedometers and GPS devices and how tracking quantities of movement forms a key part of a personal fitness plan. You may wish to read students a book on personal fitness and health such as:
  - *The Busy Body Book: A Kid's Guide to Fitness* by Lizzy Rockwell
  - *Albert the Running Bear's Exercise Book* by Barbara Isenberg & Marjorie Jaffe

- *Dudley: The Little Terrier That Could* by Stephen Green-Armytage
  - *Murphy Meets the Treadmill* by Harriet Ziefert
5. Invite a guest speaker into the class such as personal trainer, athlete, or sports medicine expert. AND/OR  
Take a field trip to a local gym and ask students to observe and describe cardiovascular workout equipment such as treadmills, stationary bicycles, and elliptical trainers. How might students describe these pieces of equipment using mathematics terminology (e.g., the treadmill helps people add steps to their daily total)?
6. Over a period of a week ask students to take measurements of the following four activities using the attached *Data Collection Sheet*:
- How far does the student travel each day through moving their bodies using their muscles, instead of by vehicles or electronic means (students can count in paces and convert to standard units of measurement using their stride length)
  - How far does the student travel in a day by vehicle?
  - How much of the student’s time in a day is spent sitting and sleeping?
  - How much of the student’s time in a day is spent doing some sort of movement or fitness activity?
- Students may want to present their findings by constructing bar graphs that describe the data for each day of the week.
7. Introduce students to the President’s Active Lifestyle Challenge (PALA+) at [www.letsmove.gov](http://www.letsmove.gov) and the goal of increasing movement activities during the day. The student objective during the independent research process is to discover ways to increase physical activity in each student’s daily routine.

## Phase II. Independent Research

### A. Research process

1. Selecting a topic. In small groups, students should brainstorm a list of ideas for how they might increase their time spent moving physically. Students should seek a balance of what they love doing with their new fitness goals. For instance, if a student enjoys video games, how might that student still participate in those games, but also be physically active at the same time? Students may wish to complete the Activity Inventory to identify areas for change. Student topics should focus on studying changes to one of the following areas:
  - their daily choices and behaviors,
  - the mechanics/structure of their activities (e.g., how a game is played), or
  - a technological change to either a mode of transportation or new type of fitness equipment.
2. Asking guiding questions. Each student creates a KWHL chart. Encourage the students to include questions like, “In what ways might this activity be modified to increase physical

movement, while still being enjoyable and safe? During what time periods of the day am I most active? Which time periods— during the period from when I wake up to when I go to sleep— have the least amount of physical activity? What are the activities of my friends and how might we increase our physical fitness as a group? What safety precautions need to be taken with a fitness plan, game, or mode of personal transportation?”

3. Creating a research proposal. Brainstorm with students how to find the answers to the questions in their *W* and *H* columns.
4. Conducting the research. Collaborate with the librarian to provide books and/or websites with visuals that students can access with help. Analyze current sports activities and games to determine how they are played (game mechanics). Review methods of personal transportation that use physical movement to provide forward motion (e.g., bicycles, scooters, skateboards, roller skates, rowboats). Observe individuals using fitness equipment. Student can interview personal trainers, the physical fitness instructor, or other mentors with expertise in the field. Conduct a survey of peers related to which physical fitness activities are the most enjoyable and why.
5. Proposing solutions. Each student gathers his/her research and designs a product to be used as an intervention.

## B. The product

Each student within the group should develop ONE of the following products:

1. A public service announcement for a new plan to help kids increase their physical fitness activities
2. A new game, sport, or altered activity that increases physical fitness. Predict how this game will increase movement and use mathematics terms to describe your findings
3. An invention such as a new piece of fitness equipment or a new method of transportation that increases physical fitness

Use mathematics terms to describe the nature of the problem, make predictions on the impact of the intervention (i.e., the plan, game, or invention), and indicate how the intervention will be marketed and sold to students and parents. Each product should also list safety considerations.

## C. Communication

Each group presents their concept for a physical fitness intervention (i.e., fitness plan, sport/game, or invention) to classmates using appropriate vocabulary. The group should take questions or comments at the end of the presentation.

## D. A completed project consists of:

1. Completed data collection chart and bar graphs illustrating areas for change
2. A KWHL chart

3. Notes for the student's plan or design
4. The product (PSA, prototype of game/activity, etc.)
5. A poster describing the design, complete with charts describing its merits
6. Videotape or audiotape of the presentation, including the Q&A session

## Additional Resources

Students are encouraged to work with their teachers and parents/guardians to conduct the research necessary to support and enhance each task, following local district guidelines. Online resources like The Smithsonian Museum, The Library of Congress, The Texas State Archives, Texas State Historical Association, and National Geographic's Kids offer information on a variety of topics and could serve as a good starting place.

## Texas Essential Knowledge and Skills

The unit may address the following TEKS:

### English Language Arts and Reading:

- |      |  |
|------|--|
| 2.1  | Understands how English is written and printed   |
| 2.3  | Comprehends a variety of texts drawing on useful strategies as needed  |
| 2.4  | Reads grade-level text with fluency and comprehension  |
| 2.5  | Understands new vocabulary and uses it when reading and writing  |
| 2.6  | Analyzes, makes inferences and draws conclusions about theme and genre in different cultural, historical, and contemporary contexts and provides evidence from the text to support their understanding |
| 2.15 | Understands how to glean and use information in procedural texts and documents   |
| 2.16 | Uses comprehension skills to analyze how words, images, graphics, and sounds work together in various forms to impact meaning  |
| 2.17 | Uses elements of the writing process (planning, drafting, revising, editing, and publishing) to compose text   |
| 2.19 | Writes expository and procedural or work-related texts to communicate ideas and information to specific audiences for specific purposes  |
| 2.21 | Understands the function of and use the conventions of academic language when speaking and writing   |
| 2.24 | Asks open-ended research questions and develops a plan for answering them  |
| 2.25 | Determines, locates, and explores the full range of relevant sources addressing a research question and systematically record the information they gather  |
| 2.26 | Clarifies research questions and evaluates and synthesizes collected information   |
| 2.27 | Organizes and presents their ideas and information according to the purpose of the research and their audience   |
| 2.28 | Uses comprehension skills to listen attentively to others in formal and informal settings  |
| 2.29 | Speaks clearly and to the point, using the conventions of language   |

2.30 Works productively with others in teams

### Mathematics:

- 2.1 Uses mathematical processes to acquire and demonstrate mathematical understanding
- 2.2 Applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value
- 2.6 Applies mathematical process standards to connect repeated addition and subtraction to multiplication and division situations that involve equal groupings and shares
- 2.7 Applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships
- 2.9 Applies mathematical process standards to select and use units to describe length, area, and time
- 2.10 Applies mathematical process standards to organize data to make it useful for interpreting information and solving problems

### Science:

- 2.2 Develops abilities necessary to do scientific inquiry in classroom and outdoor investigations
- 2.6 Knows that forces cause change and energy exists in many forms
- 2.9 Knows that living organisms have basic needs that must be met for them to survive within their environment

### Social Studies:

- 2.2 Understands the concepts of time and chronology
- 2.3 Understands how various sources provide information about the past and present
- 2.17 Understands how science and technology have affected life, past and present
- 2.18 Applies critical-thinking skills to organize and use information acquired from a variety of valid sources, including electronic technology
- 2.19 Communicates in written, oral, and visual forms
- 2.20 Uses problem-solving and decision-making skills, working independently and with others, in a variety of settings

### Health Education:

- 2.1 Understands that personal health decisions and behaviors affect health throughout the life span
- 2.3 Understands the basic structures and functions of the human body and how they relate to personal health throughout the life span
- 2.5 Recognizes factors that influence the health of an individual
- 2.7 Recognizes the influence of media and technology on personal health
- 2.8 Understands how relationships influence personal health
- 2.11 Demonstrates critical-thinking, decision-making, goal-setting and problem-solving skills for making health-promoting decisions

## Texas College and Career Readiness Standards

This unit may address the following Texas College and Career Readiness Standards:

### English Language Arts:

- I.A.2 Generates ideas and gathers information relevant to the topic and purpose, keeping careful records of outside sources
- I.A.3 Evaluates relevance, quality, sufficiency, and depth of preliminary ideas and information, organizes material generated, and formulates thesis
- II.A.1 Uses effective reading strategies to determine a written work’s purpose and intended audience
- II.A.2 Uses text features and graphics to form an overview of informational texts and to determine where to locate information
- II.B.3 Uses reference guides to confirm the meanings of new words or concepts
- II.D.1 Describes insights gained about oneself, others, or the world from reading specific texts
- III.A.1 Understands how style and content of spoken language varies in different contexts and influences the listener’s understanding
- III.A.2 Adjusts presentation (delivery, vocabulary, length) to particular audiences and purposes
- III.B.1 Participates actively and effectively in one-on-one oral communication situations
- III.B.2 Participates actively and effectively in group discussions
- IV.B.1 Listens critically and responds appropriately to presentations
- IV.B.2 Listens actively and effectively in one-on-one communication situations
- IV.B.3 Listens actively and effectively in group discussions
- V.A.1 Formulates research questions
- V.A.2 Explores a research topic
- V.A.3 Refines research topic and devises a timeline for completing work
- V.B.1 Gathers relevant sources
- V.B.3 Synthesizes and organizes information effectively
- V.C.1 Designs and presents an effective product
- V.C.2 Uses source material ethically

### Mathematics:

- I.A.1 Compares real numbers
- I.B.1 Performs computations with real and complex numbers
- II.A.1 Explains and differentiates between expressions and equations using words such as “solve,” “evaluate,” and “simplify”
- II.D.1 Interprets multiple representations of equations and relationships
- II.D.2 Translates among multiple representations of equations and relationships



- IV.A.1 Selects or uses the appropriate type of unit for the attribute being measured
- IV.B.1 Converts from one measurement system to another
- VI.A.1 Plans a study
- VI.B.1 Determines types of data
- VI.B.2 Selects and applies appropriate visual representations of data
- VI.B.3 Computes and describes summary statistics of data
- VIII.A.1 Analyzes given information
- VIII.A.2 Formulates a plan or strategy
- VIII.A.3 Determines a solution
- VIII.C.1 Formulates a solution to a real world situation based on the solution to a mathematic problem
- VIII.C.2 Uses a function to model a real-world situation
- VIII.C.3 Evaluates the problem solving process
- IX.A.2 Uses mathematical language to represent and communicate the mathematical concepts in a problem
- IX.A.3 Uses mathematics as a language for reasoning, problem solving, making connections, and generalizing
- IX.B.2 Summarizes and interprets mathematical information provided orally, visually, or in written form within the given context
- IX.C.1 Communicates mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words
- IX.C.2 Creates and uses representations to organize, record, and communicate mathematical ideas
- IX.C.3 Explains, displays, or justifies mathematical ideas and arguments using precise mathematical language in written or oral communications
- X.A.2 Connects mathematics to the study of other disciplines
- X.B.1 Uses multiple representations to demonstrate links between mathematical and real-world situations
- X.B.2 Understands and uses appropriate mathematical models in the natural, physical, and social sciences

### Science:

- I.A.4 Relies on reproducible observations of empirical evidence when constructing, analyzing, and evaluating explanations of natural events and processes
- I.B.1 Designs and conducts scientific investigations in which hypotheses are formulated and tested
- I.C.1 Collaborates on joint projects
- I.E.1 Uses several modes of expression to describe or characterize natural patterns and phenomena. These modes of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic
- I.E.2 Uses essential vocabulary of the discipline being studied
- III.B.2 Sets up apparatuses, carries out procedures, and collects specified data from a given set of appropriate instructions



- III.B.3 Recognizes scientific and technical vocabulary in the field of study and uses this vocabulary to enhance clarity of communication
- III.C.1 Prepares and represents scientific/technical information in appropriate formats for various audiences
- III.D.1 Uses search engines, databases, and other digital electronic tools effectively to locate information
- III.D.2 Evaluates quality, accuracy, completeness, reliability, and currency of information from any source
- V.C.1 Recognizes patterns of change
- V.D.1 Understands that scientists categorize things according to similarities and differences

### Social Studies:

- IV.A.1 Identifies and analyzes the main idea(s) and point(s) of view in sources
- IV.A.2 Situates an informational source in its appropriate contexts
- IV.A.6 Reads research data critically
- IV.B.1 Uses established research methodologies
- IV.B.3 Gathers, organizes, and displays the results of data and research
- IV.B.4 Identifies and collects sources
- IV.C.1 Understands/interprets presentations critically
- IV.D.1 Constructs a thesis that is supported by evidence
- V.A.1 Uses appropriate oral communication techniques depending on the context or nature of the interaction
- V.A.2 Uses conventions of standard written English
- V.B.1 Attributes ideas and information to source materials and authors

### Cross-Disciplinary Standards:

- I.A.1 Engages in scholarly inquiry and dialogue
- I.B.3 Gathers evidence to support arguments, findings, or lines of reasoning
- I.B.4 Supports or modifies claims based on the results of an inquiry
- I.C.1 Analyzes a situation to identify a problem to be solved
- I.C.2 Develops and applies multiple strategies to solving a problem
- I.C.3 Collects evidence and data systematically and directly related to solving a problem
- I.D.1 Self-monitors learning needs and seeks assistance when needed
- I.D.2 Uses study habits necessary to manage academic pursuits and requirements
- I.E.1 Works independently
- I.E.2 Works collaboratively
- I.F.1 Attributes ideas and information to source materials and people
- I.F.2 Evaluates sources for quality of content, validity, credibility, and relevance
- I.F.3 Includes the ideas of others and the complexities of the debate, issue, or problem
- I.F.4 Understands and adheres to ethical codes of conduct

- II.A.3 Identifies the intended purpose and audience of the text
- II.A.4 Identifies the key information and supporting details
- II.A.5 Analyzes textual information critically
- II.A.6 Annotates, summarizes, paraphrases, and outlines texts when appropriate
- II.B.1 Writes clearly and coherently using standard writing conventions
- II.B.2 Writes in a variety of forms for various audiences and purposes
- II.C.2 Explores a research topic
- II.C.3 Refines research topic based on preliminary research and devises a timeline for completing work
- II.C.4 Evaluates the validity and reliability of sources
- II.C.5 Synthesizes and organizes information effectively
- II.C.6 Designs and presents an effective product
- II.C.7 Integrates source material
- II.C.8 Presents final product
- II.E.1 Uses technology to gather information
- II.E.2 Uses technology to organize, manage, and analyze information
- II.E.3 Uses technology to communicate and display findings in a clear and coherent manner
- II.E.4 Uses technology appropriately

**ATTACHMENT 1****Data Collection Sheet**

Name: \_\_\_\_\_

Stride length \_\_\_\_\_ (inches or centimeters)

**Record the distance you traveled using your body movement.**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

**Record the distance you traveled by vehicle.**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

**Record the time you spent sitting or sleeping.**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

**Record the time you spent doing some sort of fitness or movement activity.**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

## ATTACHMENT 2

## Activity Inventory

Monday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

## ATTACHMENT 2

Tuesday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

## ATTACHMENT 2

Wednesday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

## ATTACHMENT 2

Thursday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				



## ATTACHMENT 2

Friday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

## ATTACHMENT 2

Saturday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

## ATTACHMENT 2

Sunday				
Time	Activity	How much do I enjoy the activity? 1= I do not enjoy it. 10 = It is my favorite activity.	Would I be willing to replace this activity?	Might I be able to adapt this activity?
7:00 am – 8:00 am				
8:00 am – 9:00 am				
9:00 am – 10:00 am				
10:00 am – 11:00 am				
11:00 am – 12:00 pm				
1:00 pm – 2:00 pm				
3:00 pm – 4:00 pm				
4:00 pm – 5:00 pm				
5:00 pm – 6:00 pm				
7:00 pm – 8:00 pm				

ATTACHMENT 3

KWHL Chart

K	W	H	L
What I <u>K</u> now	What I <u>W</u> ant to Know or the problem I <u>W</u> ant to Solve	<u>H</u> ow will I find information? (Which resources, web pages, texts, formulas, methods, etc.)	What I <u>L</u> earned