Smart Steps Count

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FOR PRIMARY SCHOOLS

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Introduction

Being active every day is important for a healthy body and mind. Australia's Physical Activity Guidelines for children (5-12 years) suggest:

- 60 minutes of moderate to vigorous physical activity every day
- children should minimise the time they spend being sedentary and to break up long periods of sitting as often as possible.

Research indicates that many children do not achieve these benchmarks. It is also been shown that students who are physically active are more likely to achieve better academically. Schools are ideally placed to provide opportunities for students to acquire the skills, understanding and confidence to pursue regular activity and move toward being physically active adults.

Why Walk?

There are many benefits to walking – it is easy to do, requires no equipment, and it's free! See Victoria Walks website if you need further convincing. It is relatively easy to incorporate walking into many classroom activities, not just PE. All physical activity accumulated throughout the day has health benefits; encouraging students to "Move more, sit less." and increase their daily steps, irrespective of intensity, is valuable.

Pedometers

Pedometers are a great device that can be used to establish information about current activity levels and to identify opportunities to increase activity. Focussing on steps takes the emphasis off winning/losing/fitness and supports the idea that being active every day is important.

Experience suggests that students enjoy wearing and using a pedometer and many rise to the challenge of increasing their individual step counts with great enthusiasm. It has also been reported that this enthusiasm can spread to family members too! A win, win! Children's activity levels are often modelled on their parent behaviours. Keeping parents informed and encouraging them to become involved will add to the success of these activities.

Smart Steps Count

This two part resource is aimed at upper primary school students. Activity outlines and basic ideas for recording and reporting are included, however teachers are encouraged to modify and adapt these to suit students' requirements. Encourage students to create their own challenges and to incorporate more "steps" into their day every day!

Part 1 requires classroom use of a pedometer and includes ideas to increase physical activity while conducting fair tests and developing skills in recording, interpreting and analysing data.

Part 2 suggests activities that require the extended use of a pedometer including out of school hours. VicHealth's Walk to School in October provides a perfect opportunity to complete these activities, or they could be completed as "active homework" tasks with parental supervision.

Pedometer Play

As with any new piece of equipment, it is a good idea to work through responsible use and care with students. Discourage students from shaking a pedometer. You may like to use the "You shake it. I'll take it rule". Shaking it will give an inaccurate reading and may also cause damage to the internal mechanism.

However, allowing students some "fiddle and jiggle" time to explore the buttons and functions before commencing more structured activities is a successful way to take advantage of their natural curiosity and to orientate them with the device.

You may also choose to:

• **Create a loan system** – number the pedometers so that they are easily identified.

• **Use a signed agreement** re the loan of the pedometer – a great way to involve and communicate with families!

Setting up the Round Step Pedometer

The Round Step Pedometer can count steps, indicate distance travelled and calories burned.

The activities in this resource use the pedometer in Step Counter Mode only.

Press the **MODE** button several times and note how the display changes.

Step Counter Mode

Distance Travelled Mode

Calories Burned Mode

Step Counter Mode
• Press the **MODE** button till the display shows **STEP**
• Hold the **RESET** button for a couple of seconds till the display shows zero.

You are now ready to start stepping!

ACTIVITY 1: Pedometers in Accurate Action

The task: To familiarise using a pedometer and to test how its accuracy may be affected by where it is worn and the type of steps taken.

You will need
- A pedometer (set to STEP).

What to do
- Decide on the positions in which you will test your pedometer and the different type of steps you will take.
- Create a recording table similar to the one shown.

Part 1

- Walk and count 20 steps wearing your pedometer in each position.
- Record the pedometer display then reset to zero after each trial.
- Repeat each trial three times .

Part 2

Take different types of steps and record your results.

Recording and reporting

Pedometer position 20 steps counted	DISPLAY Trial 1	DISPLAY Trial 2	DISPLAY Trial 3
In hand			
In back pocket			
At waist above right knee			
Back waist on spine			

Type of Steps 20 steps counted	DISPLAY Trial 1	DISPLAY Trial 2	DISPLAY Trial 3
Star Jump			
Backward walk			
Baby Steps			
Slide walk			
Fast walk			

- Report to your class or group about your findings.
  - » Why is it necessary to repeat the trials?
  - » Where is the most accurate place to wear your pedometer?
  - » Suggest why you believe some type of movements record more accurately than others.

Teacher notes: A pedometer works by detecting the number of up and down movements of the body. Consequently, they are most accurate when kept vertical and worn at the waist directly above the knee. For students with a fuller waist, it can also be worn on the back above the knee. If a student is not wearing clothes with a waistband, a belt or sash may be used.

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ACTIVITY 2: How long is my step?

A "step" is measured from the point of impact of one heel to the point of impact to the other heel.

Technically, a "stride" is measured from the first point of impact (heel) of one foot to the point of impact to the SAME foot. It is actually two steps! These terms are often confused and used incorrectly!

! Step words

- Brainstorm and create glossary for words that are used to describe a step and step movements.
- Add to your glossary as you complete the pedometer activities.

The task: Determine your "step length" and compare this with your classmates.

Measure from heel to heel

Each group will need
- 10 m tape measure or trundle wheel
- Chalk or sticky tape

What to do
- Complete this activity in the playground or hall.
- Estimate how far you think you will travel when you take 20 "normal" steps.
- Mark a start line and walk 20 steps as naturally as possible at your normal walking pace.
- Use chalk/tape to mark the distance travelled. (Heel to heel)
- Use a tape measure or trundle wheel to measure the distance travelled in centimetres.
- Complete 3 trials and calculate the average to ensure accuracy.

Recording and Reporting
Estimated distance for 20 steps = _____

Trial	Distance travelled in 20 Steps
1	cm
2	
3	
AVERAGE	

My step length = Average Distance travelled÷20

My step length = _____ centimeters

With your teacher
- Compare your group/class results. Does everyone have the same length step?
- List your class/group results from shortest to longest step.
- Graph and analyse the data. Are there any patterns about who has longer or shorter steps? Eg. Boys or girls, taller or shorter people?

ACTIVITY 2.1 How long is a Quick Step?

The task: Discover how your step length is affected by the speed you step.

What to do

Repeat the steps in Activity 2 but change your speed:

Trail 1: Walk as quickly as possible but do not run!

Trial 2: Run as fast as you can.

Recording and reporting

- Record your results in a table and use graphs to display your data.
- Write a paragraph to explain if and how your step length is changed when you step faster.

ACTIVITY 2.2 MATHS EXTENSION:
Body Ratios - Step length and height

The task: Explore the relationship between step length and height.

What to do

- Measure your height accurately and record.
- Divide your height by your step length. Round your answer to 2 decimal places and record.

Recording and reporting

My height	My step length	My height/ My step length
cm	cm	

With your teacher

- Combine your result to the rest of the class. You may like to graph your results on a scatter plot.
- Are the class answers similar?

Teacher notes: It has been determined that there is a relationship between step length and height. For adults this ratio is consistently about 0.41. Criminal investigators use the step length of crime scene footprints to estimate the person's height! There are many other body ratios that have been established. Students may like to investigate these as an extension activity.

Other extension ideas:

- Steps are a non-standard form of measurement. What does this mean?
- What other body parts have been used as measurement units throughout history?

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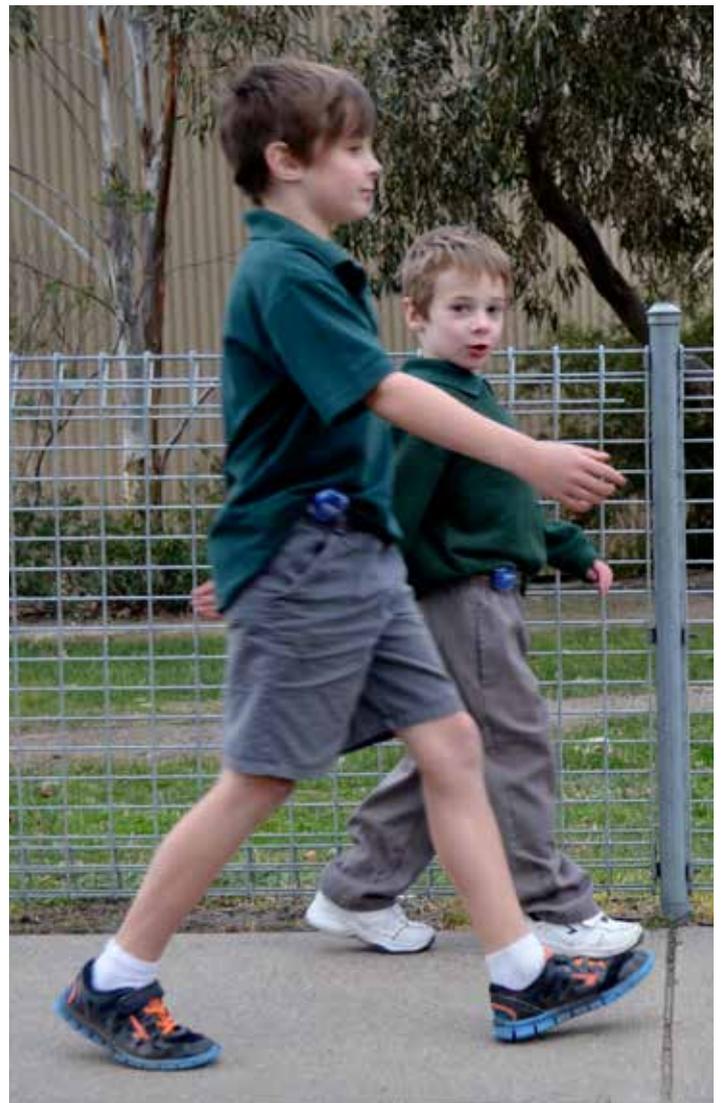
ACTVITY 3: Walking Pace

We all have a natural walking pace or rhythm that feels comfortable. The number of steps you take per minute is called *cadence.*

The task: To determine your natural walking speed in centimetres per minute.

You will need
- Pedometer
- Clock with minute hand

What to do
- Walk at your normal pace for one minute and record the number of steps taken.
- Repeat the trial three times and average your result.

Recording and reporting

Cadence = Number of steps taken per minute			
Trial 1	Trial 2	Trial 3	Average

My Walking Pace = Average Cadence x My step length

My Walking Pace = _____ X _____

My Walking Pace = _____ cm per minute

With your teacher
- Compare with your classmates. Graph your class results.
- Are you a slow or fast walker compared to others in your grade?
- Use your data to calculate how far you would walk in: 5 minutes, 15minutes, 1 hour.

! My Step Statistics

Create an artistic way to display your personalised step statistics

My step length is _____

My walking pace is _____ cm/min

It is _____ steps to my house

It is _____ steps to my favourite place.

Teacher notes:

- More able students may be able to calculate their walking speed in km/hr.
- Students could investigate average walking speeds to see how they compare.

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ACTVITY 4: Estimating Distances in Steps

In Activtiy 2 you determined your step length. Knowing this will allow you to calculate the distance between any two places.

Distance = step length x number of steps taken

The task: Put your estimation skills to the test by guessing how many steps between two places.

You will need
- Pedometer
- A "Places of Interest" Table

What to do
- Create a "Places of Interest" table for points around your classroom, school and/or community.
- Estimate how many steps between those two points.
- Use your pedometer to count the actual number of steps. Remember to reset your pedometer between each trial.

Recording and reporting

Places of Interest Table					
Start point	End point	ESTIMATED Number of Steps	ACTUAL Number of Steps	Distance in cm	Distance in m
AT SCHOOL					
My table	> Classroom door				
My desk	> Basketball ring				
Classroom door	> Canteen				
Principal's Office	> Art Room				
COMMUNITY					
School gate	> Home gate				
Home	> Shop				
School gate	> Next street corner				

- Write a paragraph to report on your estimating skills!
- Calculate the actual distance between these points. (My step length x actual number of steps)
- Convert distances in centimetres to metres.

Teacher Notes:
- Discuss with students to establish appropriate/relevant "Places of Interest"
- Students could also estimate distances between any given two points.
- Community destinations could be used as "active homework tasks" to be completed with parental assistance.

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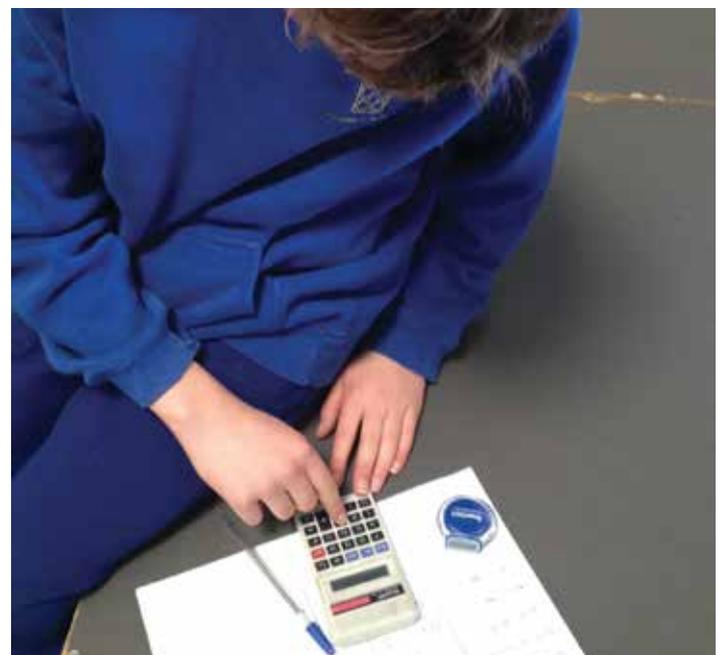
Activity 5: Pedometer Perimeters

The Task: Determine the perimeter of shapes around your school.

Recording and reporting
- Use a table or draw pictures to record your results.

SHAPE (Make up your own!)	Number of Steps	*Perimeter in cm	Perimeter in m
Basketball court			
Oval			
School building			
School Block			

Remember distance in cm = number of steps x step length in cm

With your teacher
- Discuss
  - » Did you have to measure all sides of every shape? Is there another way you could do it?
  - » Are your answers exactly the same as other students? Why not?

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Activity 6: Step Maps

The task: Make a map of a particular area or route using step distances.

You could map:
- Your classroom
- the longest and shortest way to get to the music room
- your route home from school showing how many steps between each turn or major point
- your favourite walk in the community (Active homework task)

Recording and reporting
- Share your map to see if others can follow your directions.
- Convert step distances to metres or kilometres.

Teacher notes:
- Once students are familiar with using pedometers, mapping exercises can be extended in many ways –map treasure or scavenger hunts – allow students to create their own!
- More capable students could use graph paper to map routes to scale.

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Activity 7: The Amazing Walk

This activity takes a bit of preparation beforehand but it is worth it! A little like the TV show *The Amazing Race*, students work in pairs to walk around 15 "check- points" to collect letter clues and then unscramble a word puzzle. If this activity is completed as part of PE lesson – an extra activity could be included at each station. eg. 20 star jumps

Prior to the activity you (or students) need to:

- Identify 15 check points around the playground (or hall)
- Create a map showing the 15 locations
- Set up 15 cards showing Check Point Number on one side and one of the following letters on the other
  W A L K M O R E . S I T L E S S!
  (Include punctuation to make the puzzle easier)
- Use the blank table below to create a Check Point Route and recording table for each pair. Fill it in so that each pair has a unique route to follow and will arrive at different check points at different times
- You may like to provide a "hangman" type clue to assist students to complete the puzzle.
  W _ _ _ _ O _ _ . _ I _ L _ _ _!

What to do

1. Start at your first "Check In" then follow your Check Point Route - record the number of steps you take between each check point.
2. Record the letter clue on the back of the card.
3. Walk to the next Check Point. Record your steps and the letter clue.
4. Repeat Steps 3 till you have completed all check-points
5. Calculate your total number of steps.
6. Unscramble the word puzzle to discover a very important message!

Recording and reporting
Sample table

Check Point Route	2	11	7	12	8	1	13	3	14	6	15	4	9	5	10	TOT
STEPS TAKEN	X															
Letter CLUE																X

Copy and fill in a unique check point route for each pair

Check Point Route																TOT
STEPS TAKEN	X															
Letter CLUE																X

With your teacher

- Compare the number of steps you took with other teams. Were there similar results? Discuss.
- Walk More. Sit less! Is a very important message to us all! Brainstorm how you and your family could Walk More and Sit less!

PART 2 STEP UP Challenges!

The following activities require students to wear a pedometer for an extended amount of time and assume they can use it competently. The activities provide students the opportunity discover how many steps they take at particular times and during different activities. This will provide baseline information to compare to the recommended number of steps and to discuss how they may be able to increase (or maintain) their individual step counts. Some of these activities also provide opportunities to get family members involved.

Walk to School provides the perfect opportunity to complete these activities. Data collection can be extended to include steps taken providing added incentive for students to participate. Resources, support materials and follow up activities are provided by VicHealth for registered schools. To encourage students to achieve their step count some schools have set up walking clubs before school or at lunchtime – participating students receive small incentives if they reach personal goals.

! How many steps?

Many resources suggest a daily count of 10,000 steps for adults is ideal. A 2004 study suggested 6-12 year old girls need 12,000 steps/day and boys need 15,000 steps/day to stay in a healthy weight range.

Discuss with students if they believe they would meet these targets.

- Brainstorm when and where students believe they take the most steps.

Activity 8: Estimating Activity Steps

The Task: Estimate then measure the number of steps you take during different activities.

You will need
- Pedometer
- "My Activity Table"

What to do
- Create an "My Activity Table" including typical activities in your day.
- Record the number of steps you take for each activity
- Calculate the distance in cm (number of steps x my step length) and then convert to meters.

Recording and reporting

My Activity Table	ESTIMATED Number of Steps	ACTUAL Number of Steps	Distance in cm	Distance in m
PE Class				
Recess				
Lunchtime				
During class (1 day)				
Basketball game				
Walking home				

With your teacher
- Discussion: Were your results as you expected?
- Brainstorm: Opportunities for stepping out more! How could you increase the number of steps you take during these activities?

Activity 9: Weekly Walking

This activity is ideal to use during VicHealth's Walk to School month in October. You may choose to record for the whole month or just select a week to focus on.

The task: Monitor the number of steps you take each day of the week.

Recording and reporting

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL
STEPS								
DISTANCE (m)								

- Make a graph (Steps and days) of your results. Which day do you take the most steps?
- Write an interpretation of your graph to explain the differences in the amount of steps you take each day. Eg. On Wednesday I walked to school – Thursday I was driven.
- Calculate the total number of steps, the distance travelled in metres each day and the total metres travelled.
- Do you achieve the recommended number of steps on any day? If not, challenge yourself to increase your steps a little each day to see if you can reach your target.

With your teacher
- Brainstorm ideas/opportunities for increasing the number of steps you take.
- Combine your step data to calculate how many steps your grade takes on each day of the week. Calculate the total distance travelled by your grade. Where would you have got to?

Activity 10: A Virtual Journey

This is an extension of the previous activity during which students use pedometers for an extended time and log steps taken. The time limit of the challenge could be a week or a month! Once again, this is a great opportunity for students participating in Walk to School to collect extra data.

The class total of steps and distance is calculated and used to map a virtual walk across the country. It is a way to motivate and encourage students to increase their steps and also provides some great learning opportunities along the way.

With your teacher
- How long will it take to get to the next suburb, the City, Sydney, the moon?
- Investigate significant historical, cultural, geographical information of the areas you pass through along the way.

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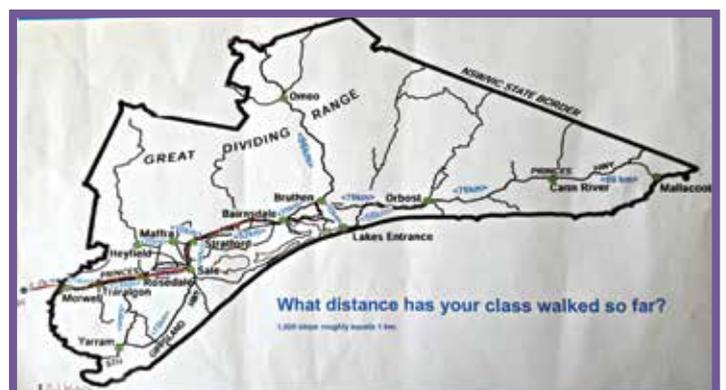
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Activity 1

Mathematics	Level 4	Level 5	Level 6
Statistics and Probability			
• Data representation and interpretation	ACMSP096	AMCSP118	ACMSP147
Science			
Science Enquiry skills			
• Questioning and predicting	ACSIS064	ACSIS231	ACSIS232
• Planning and conducting	ACSIS065	ACSIS086	ACSIS103
	ACSIS066	ACSIS087	ACSIS104
• Processing and analysing data and information	ACSIS068	ACSIS090	ACSIS107
	ACSIS216	ACSIS218	ACSIS221
• Evaluating	ACSIS069	ACSIS091	ACSIS108
• Communicating	ACSIS071	ACSIS093	ACSIS110

Activity 2 – 2.2

Mathematics	Level 4	Level 5	Level 6
Number and Algebra			
• Fractions and decimals		ACMNA100	AMCNA128
Measurement and Geometry			
• Using units of measurement	ACMMG084	ACMMG108	ACMMG135
			ACMMG137
Statistics and Probability	ACMSP095		
• Data representation and interpretation	ACMSP096	ACMSP118	ACMSP147
	ACMSP097	ACMSP120	

Activtiy 3

Mathematics	Level 4	Level 5	Level 6
Number and Algebra			
• Fractions and decimals		ACMNA100	AMCNA128
			AMCNA129
Measurement and Geometry			ACMMG135
• Using units of measurement	ACMMG084	ACMMG108	ACMMG136
			ACMMG137
Statistics and Probability	ACMSP095		
• Data representation and interpretation	ACMSP096	ACMSP118	ACMSP147
	ACMSP097	ACMSP120	

Smart Steps Count

Activity 4

Mathematics	Level 4	Level 5	Level 6
Number and Algebra			
• Fractions and decimals		ACMNA100	AMCNA128
			AMCNA129
Measurement and Geometry			ACMMG135
• Using units of measurement	ACMMG084	ACMMG108	ACMMG136
			ACMMG137
Statistics and Probability	ACMSP095		
• Data representation and interpretation	ACMSP096	ACMSP118	ACMSP147
	ACMSP097	ACMSP120	

Activity 5

Mathematics	Level 4	Level 5	Level 6
Number and Algebra			AMCNA128
• Fractions and decimals		ACMNA100	AMCNA129
Measurement and Geometry			ACMMG135
• Using units of measurement	ACMMG084	ACMMG108	ACMMG136
		ACMMG109	ACMMG137
Statistics and Probability	ACMSP095		
• Data representation and interpretation	ACMSP096	ACMSP120	ACMSP147
	ACMSP097		

Activity 6

Mathematics	Level 4	Level 5	Level 6
Measurement and Geometry			ACMMG135
• Using units of measurement		ACMMG108	ACMMG136
			ACMMG137
• Location and transformation	ACMMMG090	AMCMG113	
Statistics and Probability			
• Data representation and interpretation	ACMSP095	ACMSP118	ACMSP147
	ACMSP096	ACMSP120	