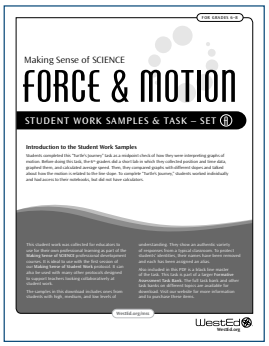

Making Sense of SCIENCE

Force & Motion: Student Work Samples & Task A

for Grades 6–8

Kirsten R. Daehler and Jennifer Folsom

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RECOMMENDED CITATION:

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About WestEd

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FOR GRADES 6–8

Making Sense of SCIENCE

FORCE & MOTION

STUDENT WORK SAMPLES & TASK – SET A

Introduction to the Student Work Samples

Students completed this "Turtle's Journey" task as a midpoint check of how they were interpreting graphs of motion. Before doing this task, the 6th graders did a short lab in which they collected position and time data, graphed them, and calculated average speed. Then, they compared graphs with different slopes and talked about how the motion is related to the line slope. To complete "Turtle's Journey," students worked individually and had access to their notebooks, but did not have calculators.

This student work was collected for educators to use for their own professional learning as part of the **Making Sense of SCIENCE** professional development courses. It is ideal to use with the first session of our **Making Sense of Student Work** protocol. It can also be used with many other protocols designed to support teachers looking collaboratively at student work.

The samples in this download includes ones from students with high, medium, and low levels of understanding. They show an authentic variety of responses from a typical classroom. To protect students' identities, their names have been removed and each has been assigned an alias.

Also included in this PDF is a black line master of the task. This task is part of a larger **Formative Assessment Task Bank.** The full task bank and other task banks on different topics are available for download. Visit our website for more information and to purchase these items.

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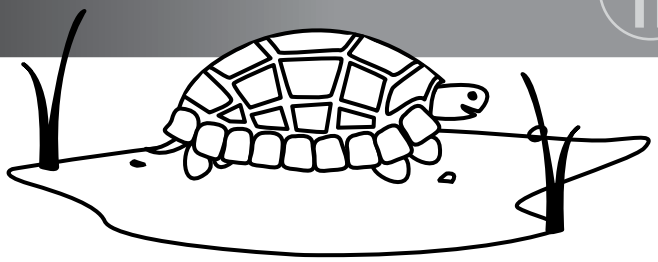
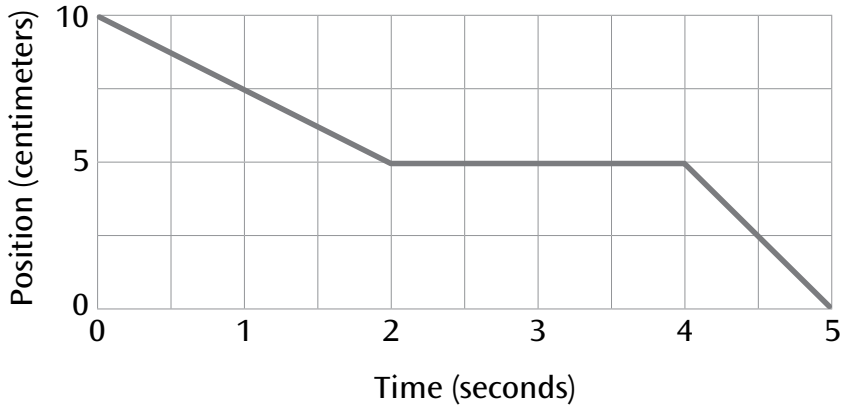
Name:

TURTLE'S JOURNEY

TASK A



The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

OVER

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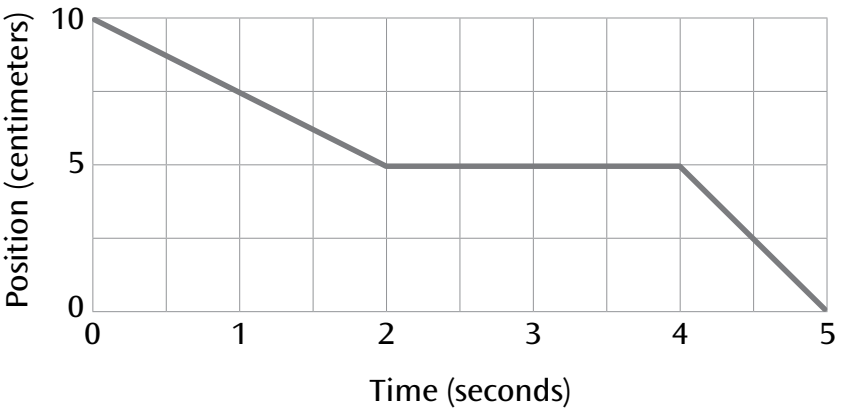
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

3 What does the "10" represent in each journey?

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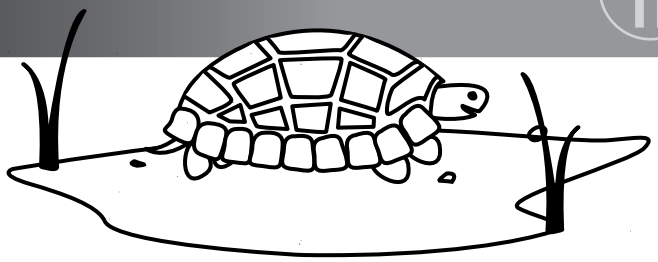
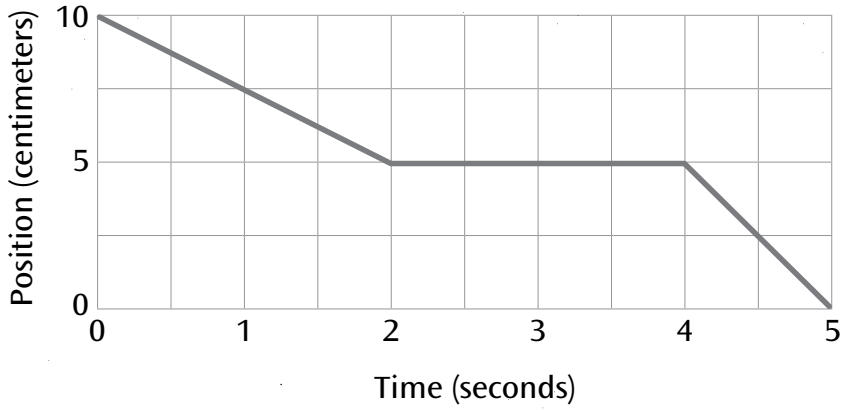
Name: **Annie**

TURTLE'S JOURNEY

TASK A



The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

In this turtle's journey I am not sure and confused if the graph is meant to be read backwards or if it supposed to be read forwards. I think that it is supposed to be read backwards but, maybe someone else thinks its supposed to be forword. They would therefore get the answer wrong, or may be I'm wrong and they'll get it right. But the turtle seems to be going downhill.

OVER

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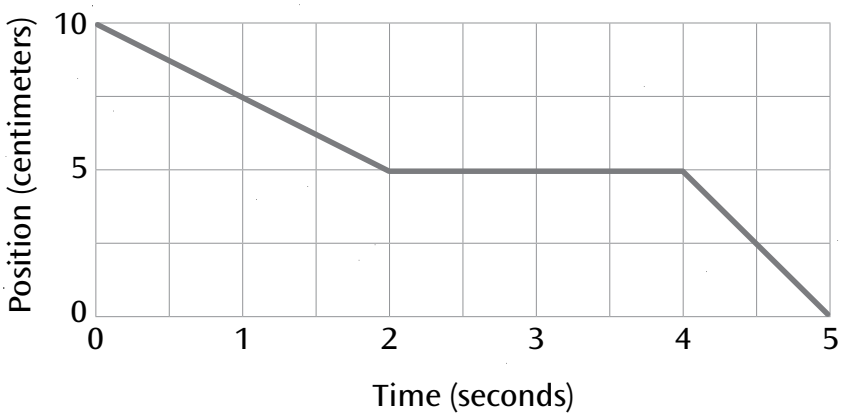
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

maybe the turtle could be going downhill to maybe lay some eggs. Probally by a beach. Or it could be coming uphill to do something like lay eggs or collect food. It might stop for a break and continue on.

3 What does the "10" represent in each journey?

10 could represent the top or it could be the bottom it definetly depends the way you look at it

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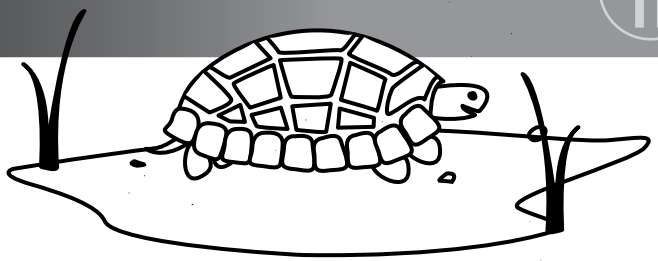
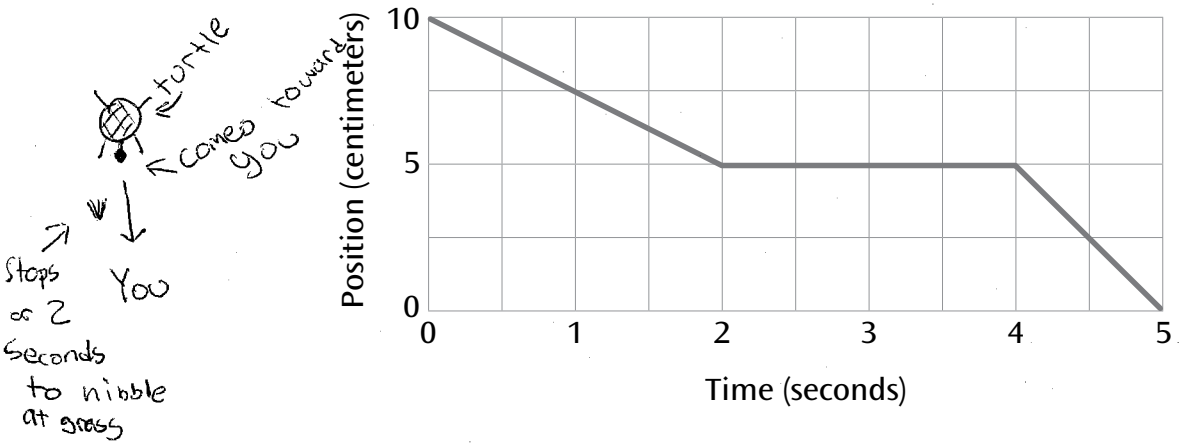
Name: **Brian**

TURTLE'S JOURNEY

TASK A



The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

Say the turtle is 10 cm away from you. He/she moves 5 cm then stops for 2 secs. He might nibble at a clump of grass, then with the remaining second walks toward you and cross the remaining Distance. The total distance is 10 cm and total seconds is 5.

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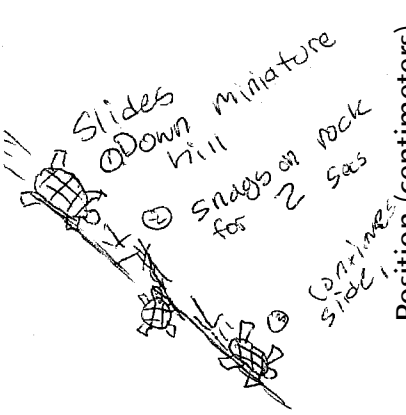
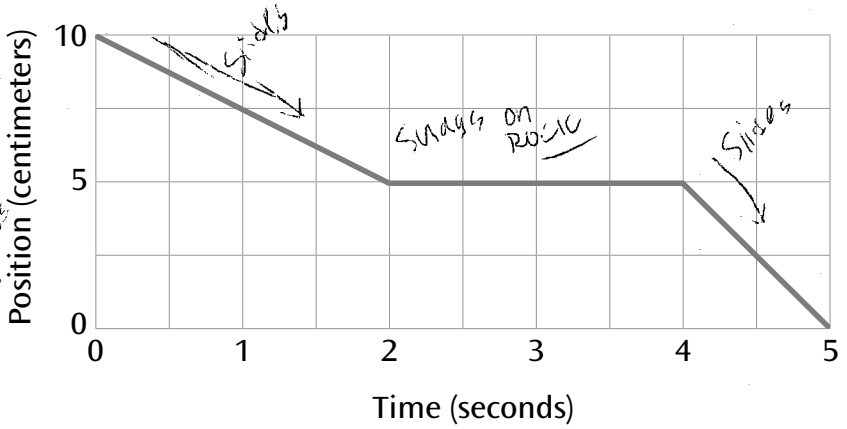
Turtle's Journey Graph





2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

The turtle Slides down a miniature hill for 5 cm and 2 seconds, The turtle then Snags on a rock for another 2 seconds, He disengages himself and slides the remaining 5 cm in 1 second, 10 cm in total. 5 seconds total.

3 What does the "10" represent in each journey?

10 represents the turtles starting point.

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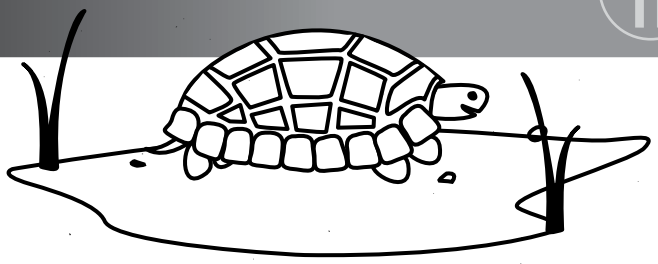
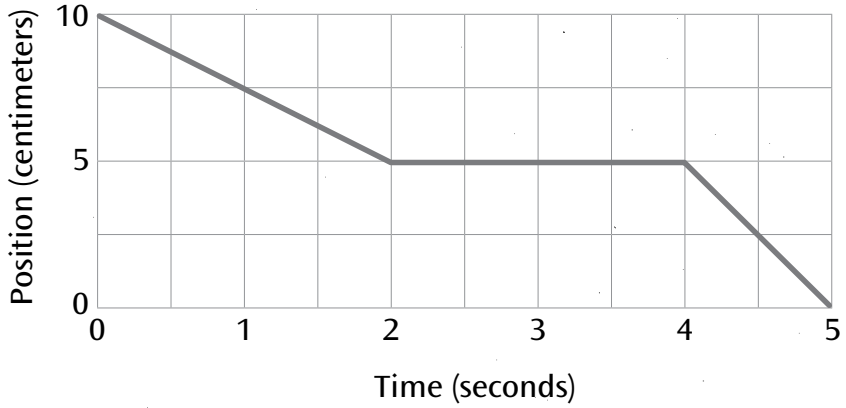
Name: **Charles**

TURTLE'S JOURNEY

TASK A

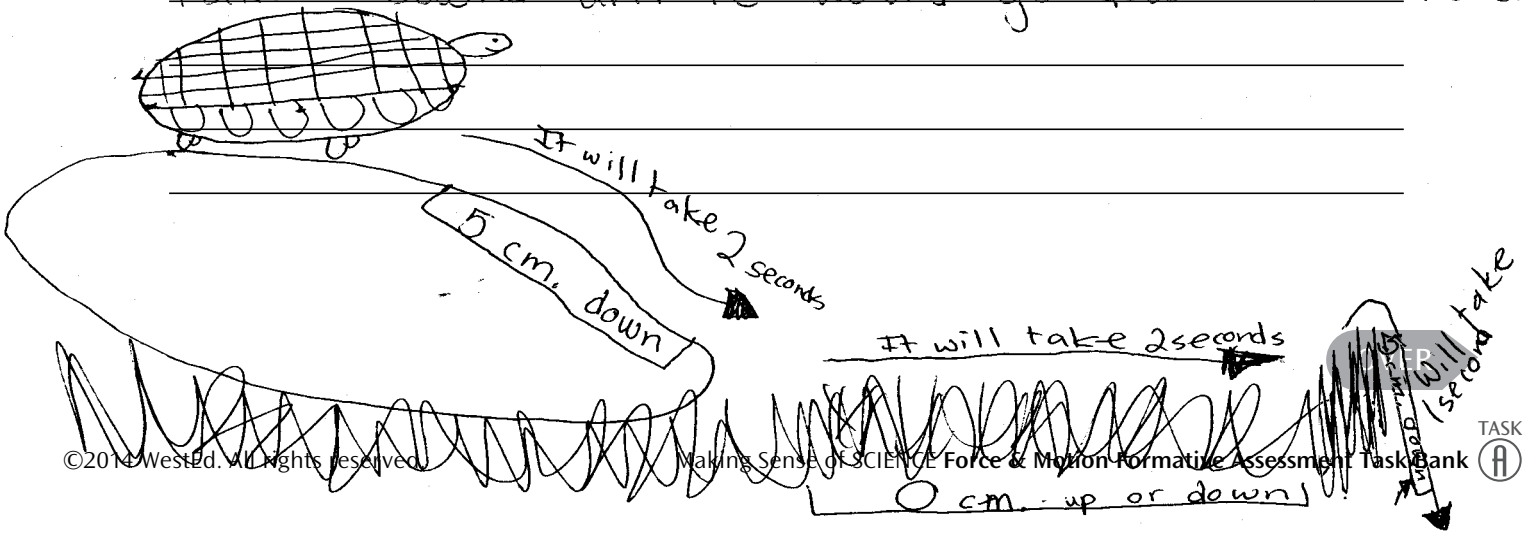


The following graph shows the journey Turtle takes.

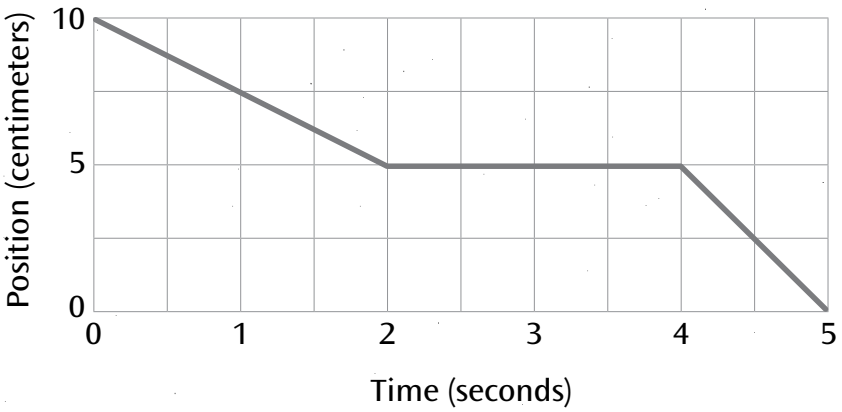


1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

I think that the turtle starts 10 centimeters above the ground. He might be on top of a rock. Then he will walk down the rock 2.5 centimeters. Then he would just walk straight across grass for 2 seconds. Then he might jump off the edje of the grass into the pond which would take 1 second and he would go down 5 centimeter



Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

The turtle would start in a pond. Then, it would swim down 5 cm in the pond to catch a fish for food. It would take 2 seconds. Then, the turtle would swim to the edje of the pond for 2 seconds, but would not go up or down at all. Then, he would see another fish and go back down quickly 5 cm for 1 more second.

3 What does the "10" represent in each journey?

The ten represents where the turtle starts which is 10 cm. above the ground.

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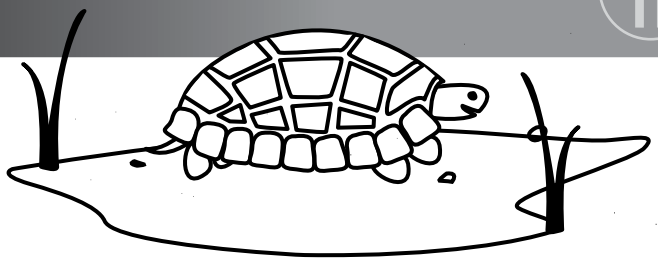
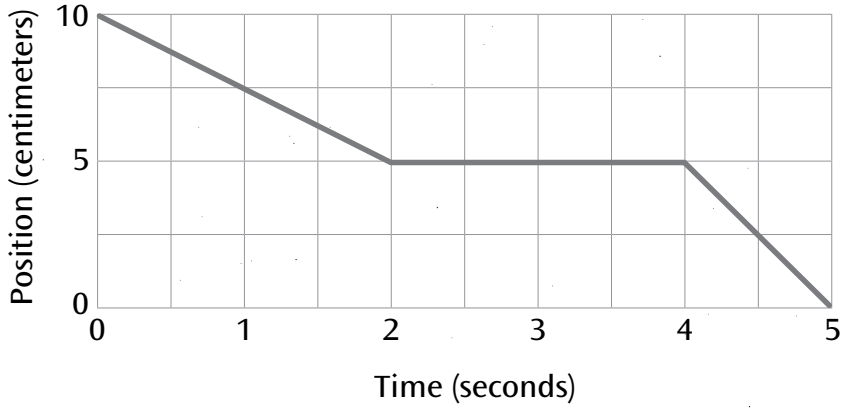
Name: **Danny**

TURTLE'S JOURNEY

TASK A

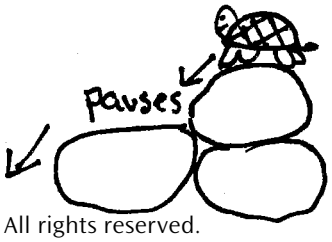


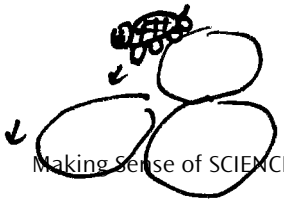
The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

I think that the turtle is stumbling over a rock, then regained his balance, then, once again, stumbled over a rock. At first, I thought it was a steep hill that got steeper, but then I realised it was only 10 centimeters for 5 seconds, so I changed my theory to him falling over 2 rocks. I'm not so clear on how or when this could have happened, or how 5 seconds would relate to 10 centimeters, and if it hints something to us.





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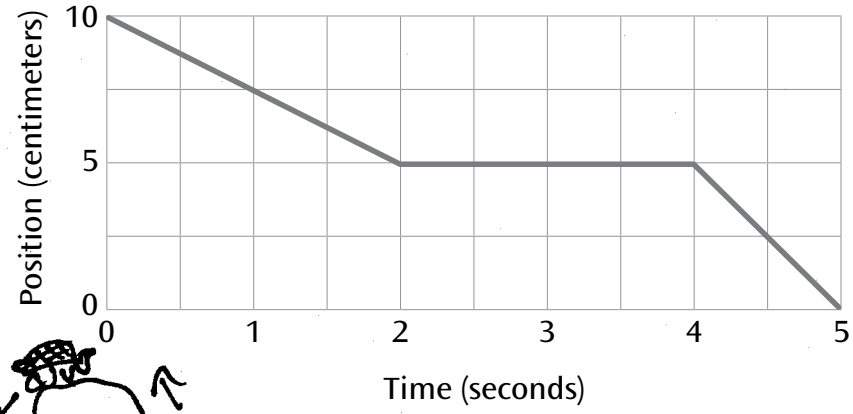
Turtle's Journey Graph

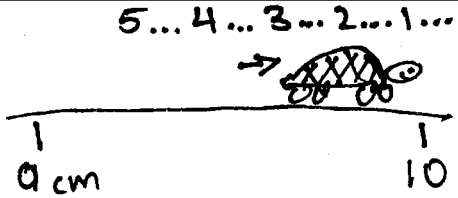


2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

A different journey the turtle could have taken is trying to get over an obstacle, like a tree branch or a rock. He tried to go up quickly, and, as it shows in the graph, he goes slower the first run, then he doesn't move, then goes faster. He might have climbed up the branch, paused for 2 seconds, then quickly went down the branch to the ground.

3 What does the "10" represent in each journey?

I honestly am not so sure why he starts on ten. Maybe thats how much he is supposed to go, and that is how many centimeters is left for him counting down from 10.



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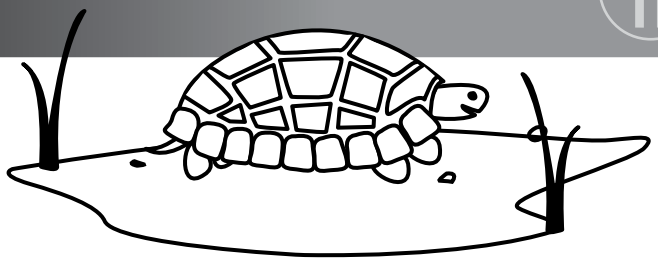
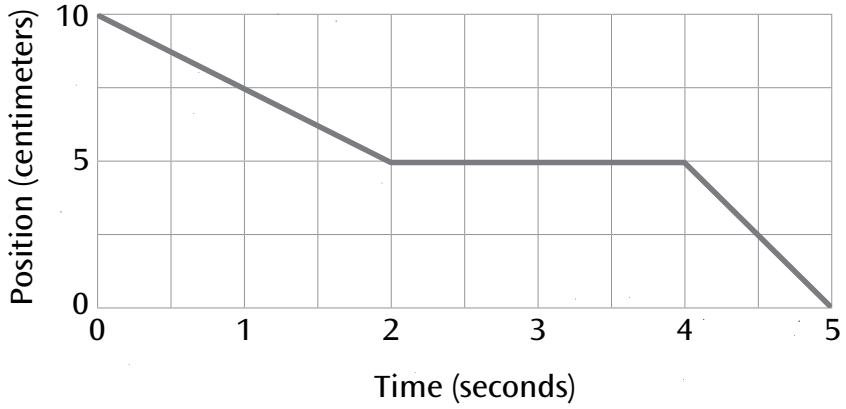
Name: **Elroy**

TURTLE'S JOURNEY

TASK A



The following graph shows the journey Turtle takes.

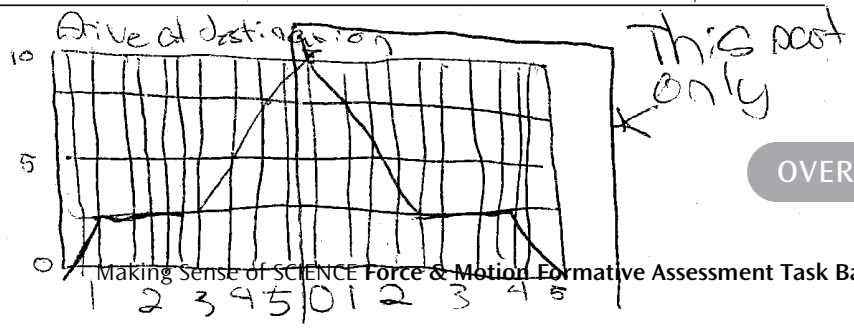


1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

~~He is moving not as increasing~~

The turtle may be returning from his journey because the chart starts at ten and finishes at 0.

Turtle is moving about 1 position/centimeters every ½ second.



OVER

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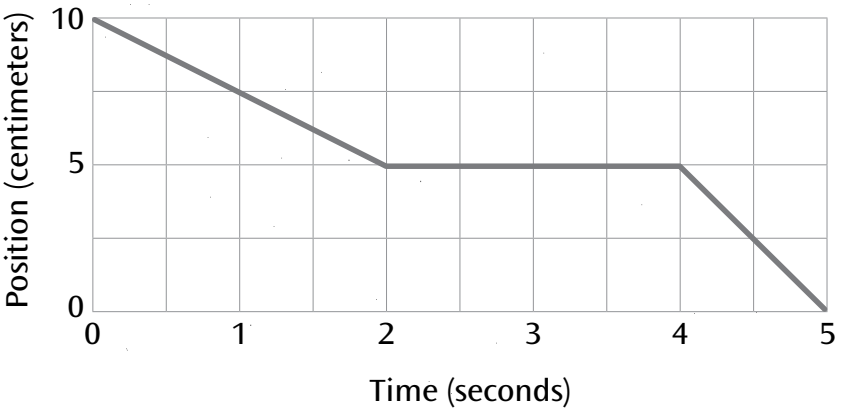
Turtle's Journey Graph

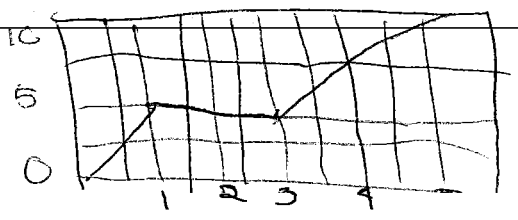


2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

A different journey turtle might take is him going to destination, but somehow the graph may have gotten reversed.

3 What does the "10" represent in each journey?

The 10 represents 10 centimeters moved.



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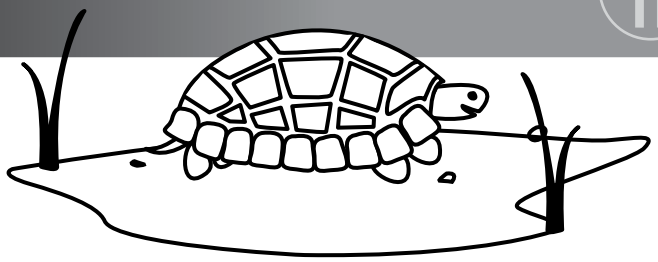
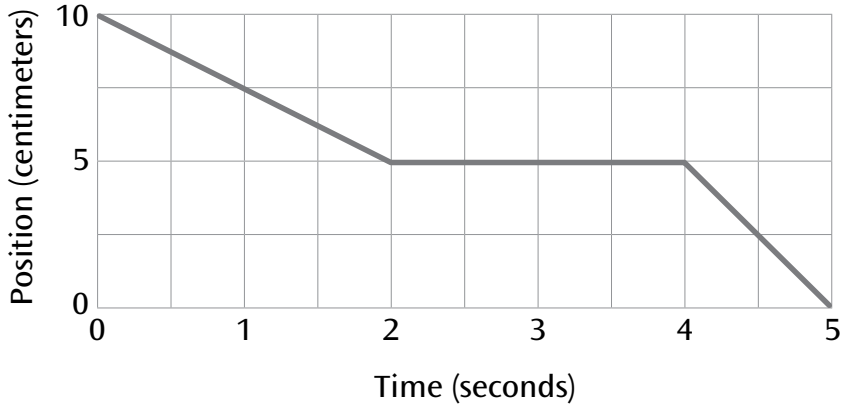
Name: **Felicity**

TURTLE'S JOURNEY

TASK A

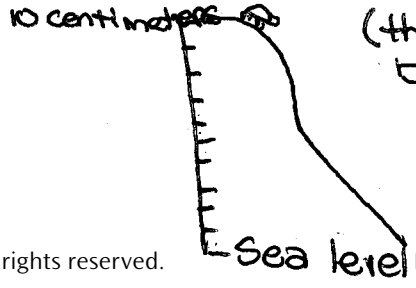


The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

This turtle is moving very slowly in comperison with a human being, we can walk 100 centimeters in 3 seconds, this gheaph is rather odd because it starts at 10 and end at 0 usually its the other way around I belive the ten is 10 in eathtude and he goes down the hill after his 0.5 second journey. Ex:



(the last 5 cen must be steeper because it took less time.)

OVER

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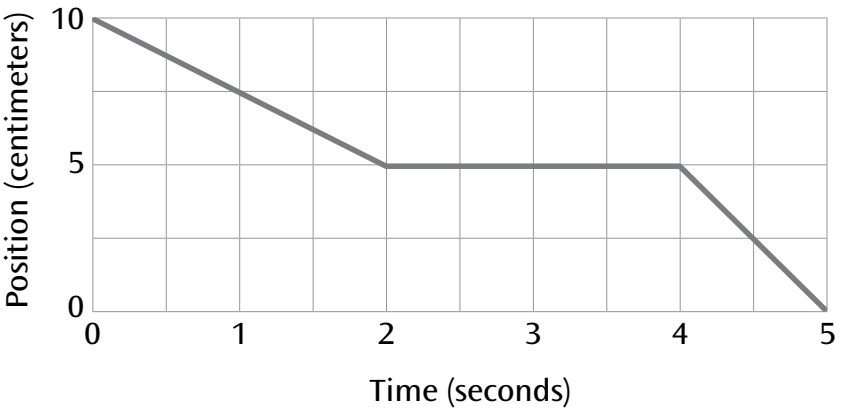
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

First the turtle is tired so he takes 2 sec to go 5 cen. Then he stops to poop wich he had been holding for a long time he has to poop alot so it takes 3 sec, because he pooped stationerely he did not go any further down the hill or closer to sea level, posponing his jurney, this takes away from the distense he went in 5 seconds. Because of his poop breath he has time to regain energy so he takes less time than before* so he can walk 5 cen in only 1 sec.

3 What does the "10" represent in each journey?

The ten represents 10 centementers in altitude or above sea level.

* before means begining of the paragraph.

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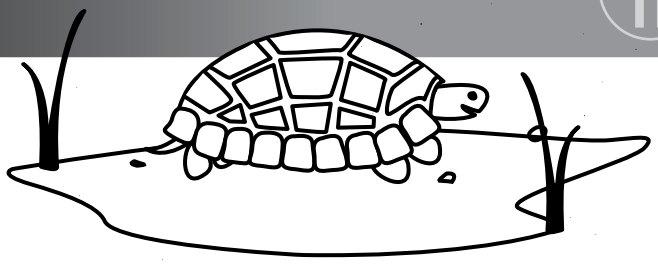
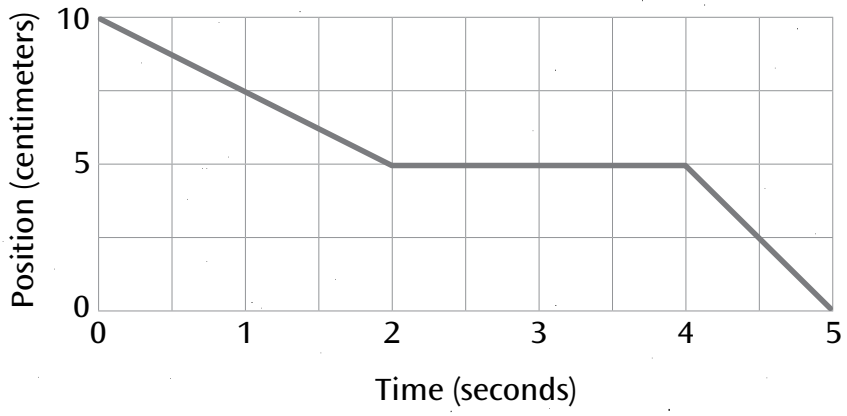
Name: **Greg**

TURTLE'S JOURNEY

TASK A



The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

The turtle moves for 2 seconds at 2.5 centimeters per second as he finds food. When he finds some he stops for 2 seconds to eat. Then he quickly goes to the next patch of food at 1 second for 5 centimeters. In this patch there is a camera videotaping him from when he was 10 centimeters away.

OVER

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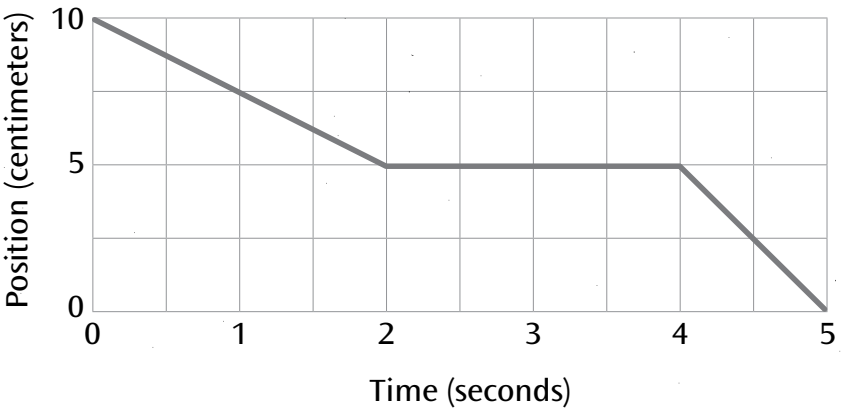
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

A turtle was practicing for a race. He decided to run the race backward. He started at the finish line (10 centimeters from the start). He ran the first 5 centimeters in 2 seconds. Then he stoped and rested for 2 seconds Then he sprinted the last 5 centimeters in 1 second.

3 What does the "10" represent in each journey?

In each journey the 10 represents 10 centimeters away from something

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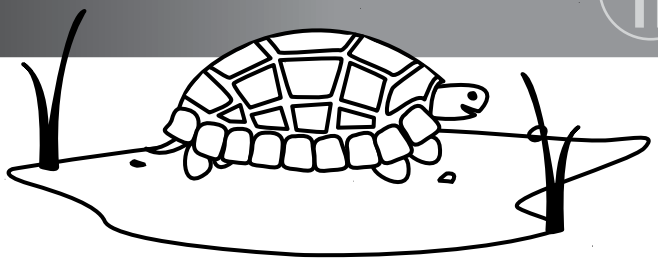
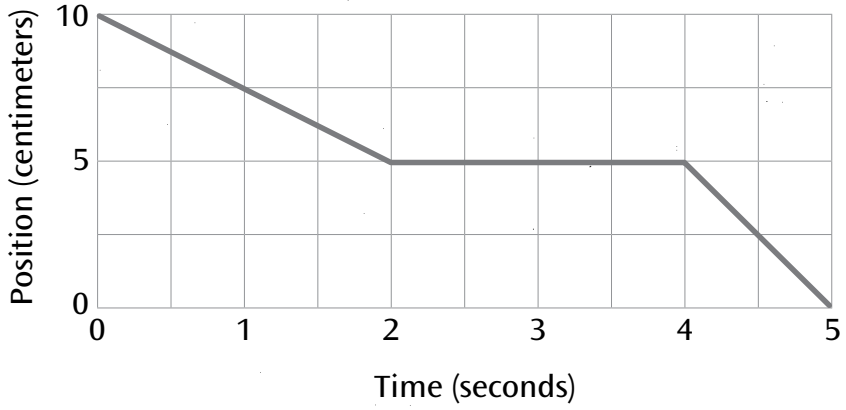
Name: **Harry**

TURTLE'S JOURNEY

TASK A

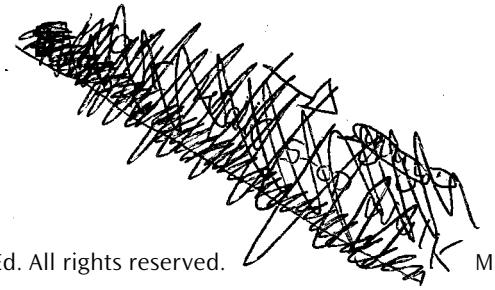


The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

The turtle is starting at a place that is 10 cm off the [illegible] ground, walking 2.5cm per second for 2seconds. Then the turtle stops for 2seconds and walks 1second. He/she is [illegible] going down hill because the cm goes from 10 to 0. I think he is going down a ramp to get to food.



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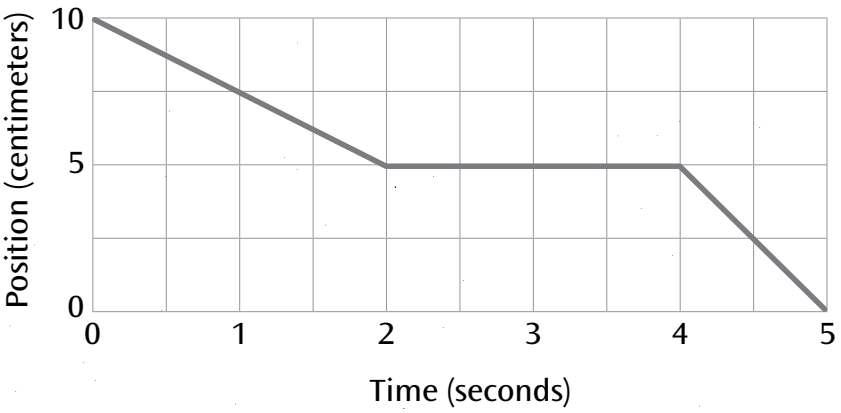
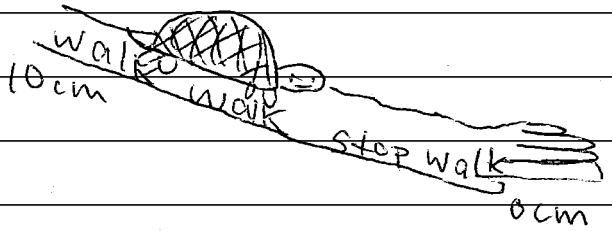
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

He/she might be walking down his owners arm while the owner is lying down. he walks 5 cm stops for 2seconds and continues for 2.5 cm.



3 What does the "10" represent in each journey?

the 10 represents how many cm Turtle is off the ground

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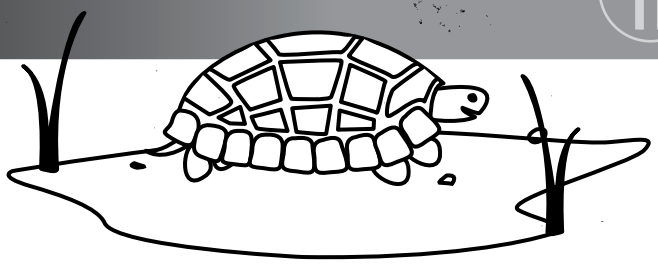
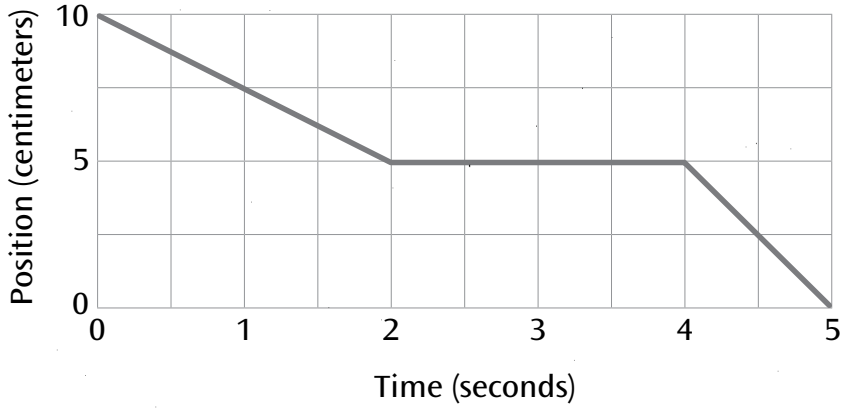
Name: **Irene**

TURTLE'S JOURNEY

TASK A

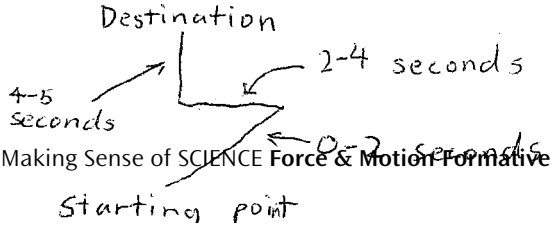


The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

I think that this is a weird graph because the turtle can't go 10 centimeters in 0 seconds. Another strange thing is that as more time passes the turtle's position decreases. I first thought that maybe the turtle was moving backwards because graphs usually show the increase of distance covered. And another thing I want to clarify is the position in centimeters on the y-axis. Is that the speed of the turtle or the distance it covered? And also during the 2-4 second mark, the turtle doesn't gain any distance. The turtle's journey might have looked like this:



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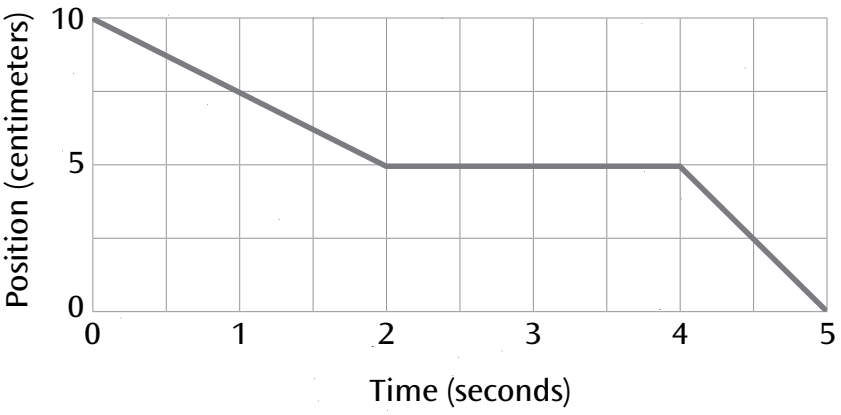
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

Since the turtle covers more distance in less time in the beginning than the end, that means that it starts out faster and starts to slow down. Except in the end, it goes really fast by covering 5 centimeters in 1 second. The turtle might have been on land to start out, and then got into the water in the end.

3 What does the "10" represent in each journey?

I think that the 10 represents the starting point in the journey. As the turtle moves, it gets closer to its destination, which is 0.

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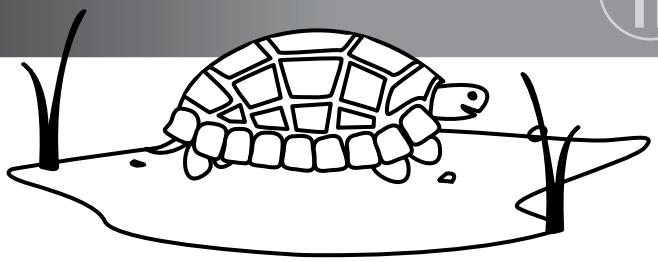
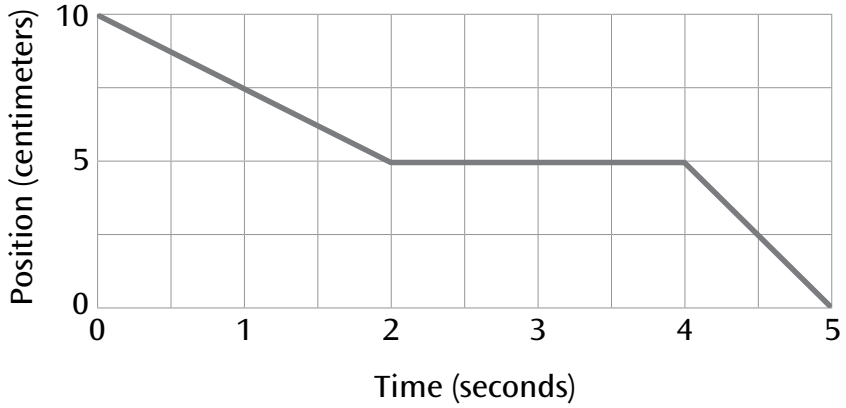
Name: Jenny

TURTLE'S JOURNEY

TASK A

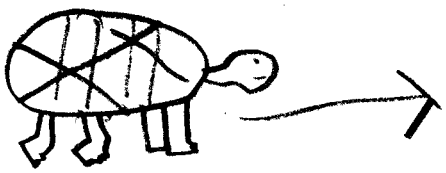


The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

The most confusing thing about this graph is how the line on the line graph is starting up instead of down. I think a person is timing the turtle on, can the turtle go 10 cm in 5 seconds. On the data I have, I'm guessing that the turtle is going prety slow.



1 2 3 4 5 6 7 8 9 10

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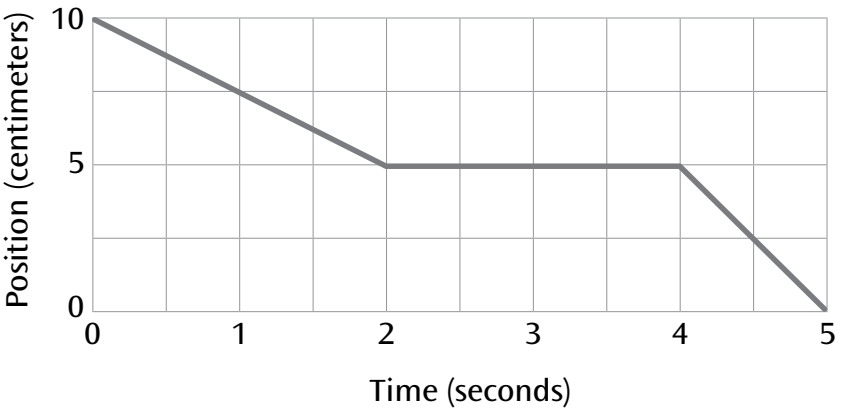
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

A diffrent a journey the turtle could have is the turtle starts at 10 cm and travels 10 cm in 5 seconds.

3 What does the "10" represent in each journey?

10 represents the starting point of each of the turtles journey

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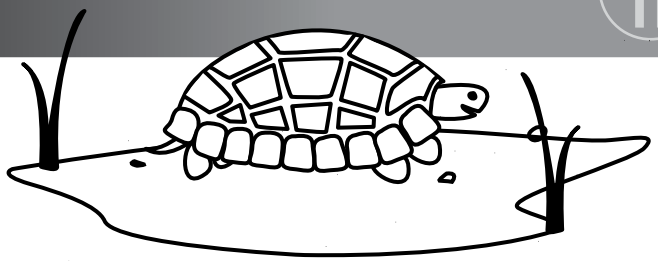
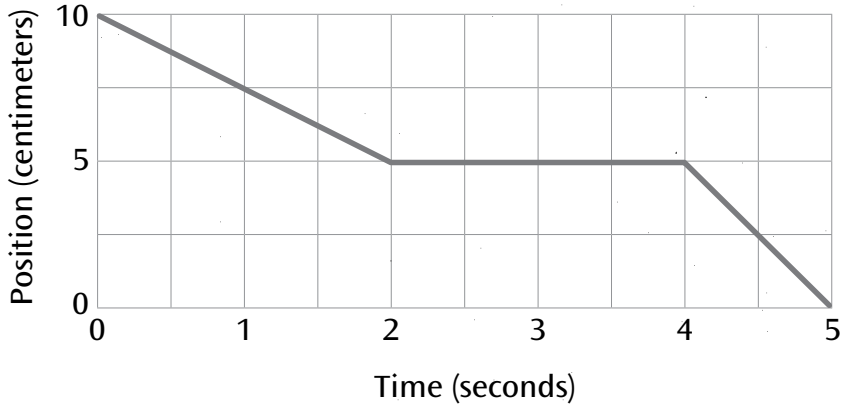
Name: **Ken**

TURTLE'S JOURNEY

TASK A

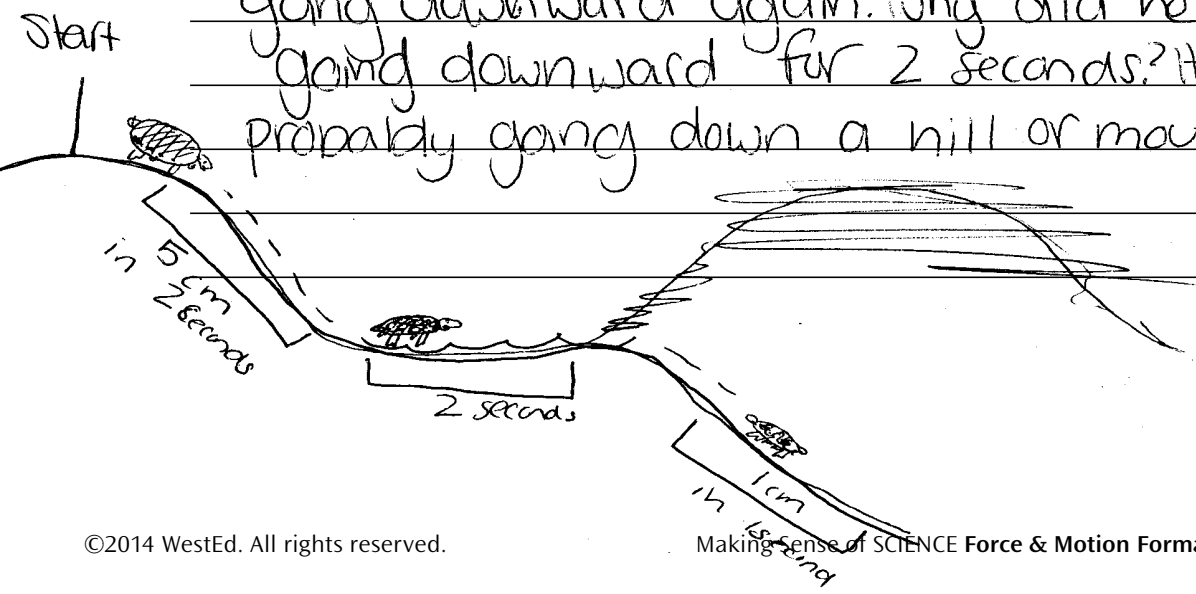


The following graph shows the journey Turtle takes.



1 Describe Turtle's journey. Where is Turtle going? How is Turtle moving?

In 1 second the turtle traveld 2½ cm and in 2 seconds it traveld 5cm. And in those 2 seconds he was going dawnward then after 2 seconds he stoped, he was going straight. When he got to 4 seconds he started going dawnward again. Why did he stop going downward for 2 seconds? He was probably going down a hill or moutains.



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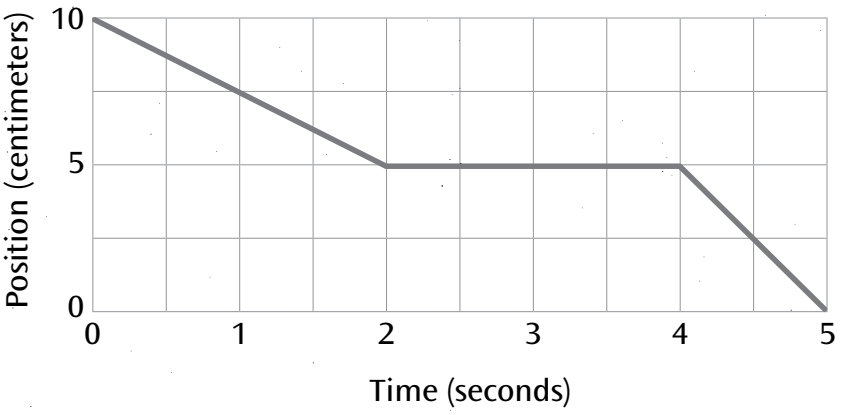
Turtle's Journey Graph



2 Can you think of a different journey Turtle might take that goes with this same graph? Describe where Turtle goes and how Turtle moves.

A different journey was he/she was going to a place where he would feel safe. So he started going. And there was a road that was pretty bumpy. he had to go up and down. first he was going down because he was slipping through mud. and then suddenly there was a pond so he stopped to drink water. Then after those 2 seconds he had to go down the road again. And way is ~~there~~ only 5 seconds and 10 cm^2.

3 What does the "10" represent in each journey?

The 10 in each journey represents 10 cm. in like how long his steps are, and how far did he move.

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