

Curriculum-Embedded Performance Task
Elementary School Science
Content Standard 5.2



Catch It!

Student Work

Connecticut State Department of Education
2011 Edition

NAME: _____

Catch It!

An Investigation of Factors Affecting Human Reaction Time

The soccer goalie on the cover page sees the ball coming and has to move quickly to reach and catch the ball. In less than a second, he must see where the ball is traveling and quickly move his arms, legs and hands so he can stop it before it goes into the goal. How can the goalie react so fast?

THINK about many factors that might affect the reaction time of different people. List your ideas below:

Observing the Reaction Times of Different People

1. Explore by following steps (a) through (c) below. Record everything you notice and wonder in the chart provided:
 - a. The “researcher” holds the ruler vertically (straight up and down). The “subject” opens the fingers of the catching hand and holds them near the bottom of the ruler, right next to the 0 cm line.
 - b. The researcher lets go of the ruler and the subject catches it by quickly pinching the fingers around the falling ruler.
 - c. The researcher reads the measurement on the ruler at the point where the fingers are holding it.



Inquiry Component I – Posing Questions

NAME: _____

I Notice	I Wonder

POSING TESTABLE QUESTIONS: What are you curious about? Based on your direct observations, previous knowledge and experiences, decide on a reaction time factor to investigate and write it here: _____

Write the scientific question you will investigate:

Inquiry Component III – Working With Data

NAME: _____

Reaction times are very fast...too fast to record accurately using a stop watch. You can use the chart below to convert the catch distance to the catch time. Find the distance closest to the one you recorded. Then look at the Reaction Time column to find out how much time it took the subject to catch the ruler. If the exact distance is not listed in the chart, estimate the reaction time by noticing the interval patterns in the chart.

Distance Ruler Dropped (in centimeters)	Reaction Time (in seconds)
1	0.05
2	0.07
3	0.08
4	0.09
5	0.10
10	0.14
15	0.18
20	0.20
25	0.23
30	0.25

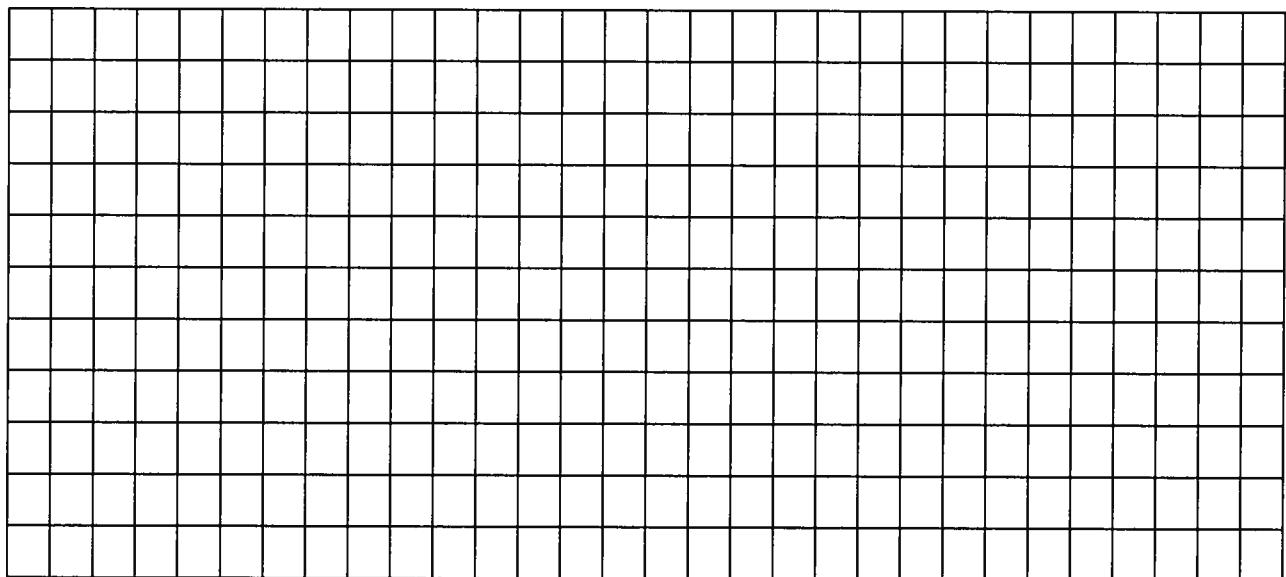
Inquiry Component III – Working With Data

NAME: _____

Record the drop distance and reaction times for each person in a table below:

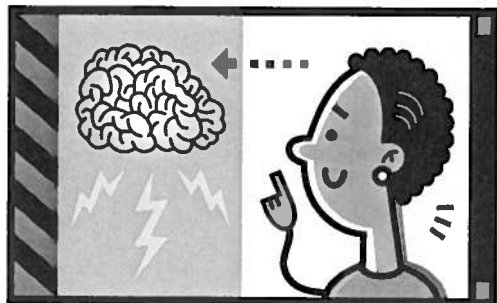
NAME	TRIAL 1						Average Time (in seconds)

Plot your data in a bar graph on the grid below. Include a title, scale and label each axis.



NAME: _____

Learn more about what's happening inside your body during the reaction time experiment. Read books, magazines or Internet sites to find out more about how your senses get information to your brain, and how your brain responds.



Write a summary describing how the brain and senses work together to help you catch the falling ruler.

What connections can you make between what you read and what you observed in Investigation 1?

NAME: _____

Investigation 2: What Affects Reaction Time?

Now that you know more about how the brain and senses work together, what do you want to investigate further?

Make observations of different people doing the “drop and catch procedure” again. What do you notice this time? Make an observation chart in the space below to record what you notice and wonder about:

Talk with your partners about a new reaction time question. It might be related to your Investigation 1 question, to something you read, or to something new you noticed. Write your question here:

Inquiry Component II – Collecting Data

NAME: _____

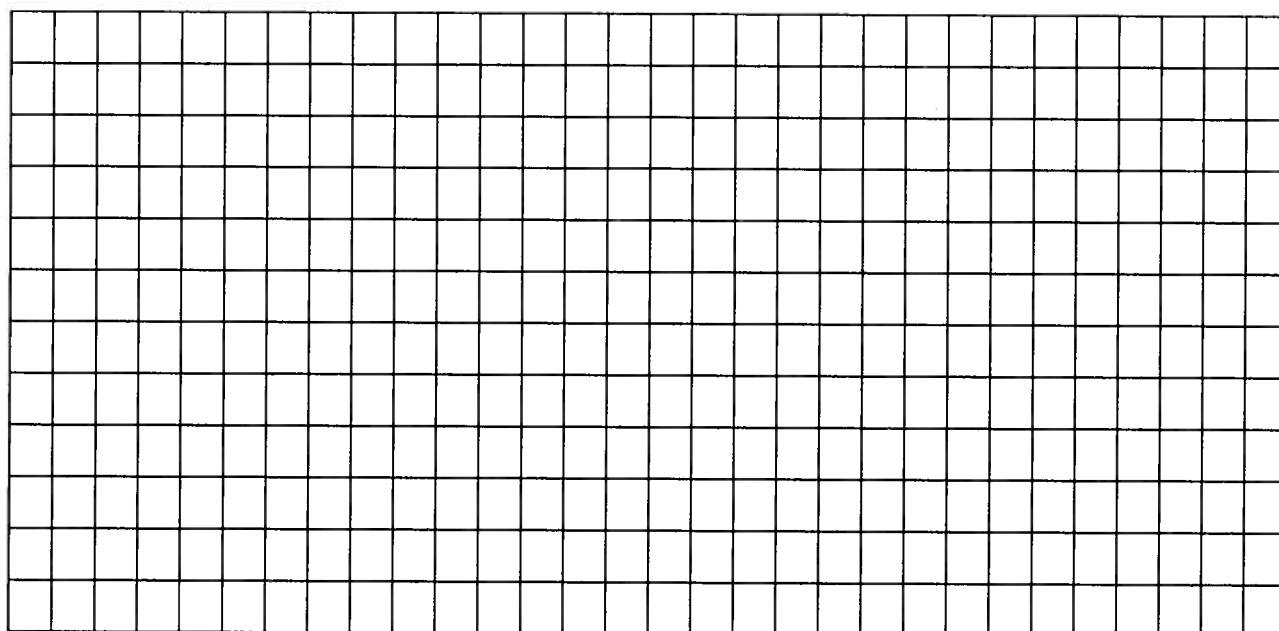
Work with your partners to plan a fair test to collect accurate data related to your question. List your materials and the steps in your procedure:

NAME: _____

Do your experiment and record your results in a data table in the space below. Use the conversion table to change the catch distance to a catch time.

Distance Ruler Dropped (in centimeters)	Reaction Time (in seconds)
1	0.05
2	0.07
3	0.08
4	0.09
5	0.10
10	0.14
15	0.18
20	0.20
25	0.23
30	0.25

Make a graph that compares the average catch times of the people you tested.



Inquiry Component IV – Communicating Conclusions

NAME: _____

Write a brief report describing your experiment, your findings and any improvements you would make:

