

# 8th Grade - OTIMMS - Lawton Lesson

## Catch Me If You Can

### Pass Objectives:

1.1b Graph and interpret the solution to linear equations on a coordinate plane.

1.1c Predict the effect on the graph of a linear equation when the slope changes.

2.1b Use basic operations on rational numbers to solve problems in real-life situations.

5.1 Select and display appropriate formats to display collected data.

### Materials:

Graph paper

Ruler

Colored pencils (optional)

### Time:

45-60 minutes

### Overview:

Students are given a real-life situation and must figure out when the two subjects will realistically meet at one point.

The students will need to construct equations, create tables, and display the solutions on a graph to support their mathematical argument.

## **Procedures:**

- ~ Divide the students into groups (three is best)
- ~ Present the situation to the class in a manner that is personal to you or them. (See Catch Me If You Can Scenario)
- ~ Have students make predictions about the situation as a class discussion.
- ~ Pass out the needed information (worksheet and materials).
- ~ Once the students have ample time to complete the assignment, facilitate a class discussion that will use their predictions to compare to their solutions.

## **Summary:**

Have each group of students report their findings in the form of graphs, tables, and equations. Make sure that students understand the purpose of the project. (i.e. organizing data into tables, creating graphs, making predictions, and using tables and graphs to determine linear equations). Possible further explorations may include, but not limited to, using graphs to determine distance, time, and rate, change in slope, and how different starting points could have effects on the graph.

## Catch Me if You Can Scenario

Sarah and Nathan are both walking to the library. Suppose Nathan is 8 blocks ahead of Sarah. Sarah is walking 2 blocks in one minute, and Nathan is walking 1 block in one minute. How long will it take for Sarah to catch up with Nathan?

### *Things you might consider:*

- What equations could be used to model the situation?
- How could data be displayed in tables that would show differences in the distance traveled over time?
- What would a graph look like that modeled Nathan and Sarah's trip to the library?

### *Follow up Questions:*

- Describe the differences you would notice in the equations, the table, and the graph if Sarah walked 3 blocks per minute and Nathan walked 2 blocks per minute.
- How can you use the equations to find the intersection of the two lines without using a table or graph?

# Catch Me If You Can

## Grading Rubric

	Four	Three	Two	One
<b>Content</b>	<ul style="list-style-type: none"> <li>~all info accurate</li> <li>~5+ correct terminology</li> <li>~all examples explained</li> </ul>	<ul style="list-style-type: none"> <li>~Some info missing</li> <li>~not all explanations included</li> <li>~4-3 terms used correct</li> </ul>	<ul style="list-style-type: none"> <li>~information and examples not tied together</li> <li>~2-1 terms used correctly</li> </ul>	<ul style="list-style-type: none"> <li>~inaccurate information</li> <li>~No terminology used</li> <li>~ missing or incorrect examples</li> </ul>
<b>Graphs and Tables</b>	<ul style="list-style-type: none"> <li>~labeled completely</li> <li>~appropriate intervals</li> <li>~intersection shown</li> </ul>	<ul style="list-style-type: none"> <li>~ Missing some labels</li> <li>~appropriate intervals</li> <li>~intersections shown</li> </ul>	<ul style="list-style-type: none"> <li>~graphs labeled inaccurate</li> <li>~inappropriate intervals</li> <li>~no intersection shown</li> </ul>	<ul style="list-style-type: none"> <li>~Graph not labeled</li> <li>~missing graph or table</li> <li>~inaccurate information</li> </ul>
<b>Follow up</b>	<ul style="list-style-type: none"> <li>~All answers completely answered</li> <li>~Accurate explanation</li> <li>~reasoning</li> </ul>	<ul style="list-style-type: none"> <li>~all answers completely answered</li> <li>~explanation and reasoning inaccurate</li> </ul>	<ul style="list-style-type: none"> <li>~all answers not included</li> <li>~explanation and reasoning inaccurate</li> </ul>	<ul style="list-style-type: none"> <li>~information missing</li> <li>~knowledge is limited</li> </ul>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>~no mathematical errors</li> <li>~all work shown</li> </ul>	<ul style="list-style-type: none"> <li>~no errors</li> <li>~ not all work visible</li> </ul>	<ul style="list-style-type: none"> <li>~minor errors</li> <li>~not all work visible</li> </ul>	<ul style="list-style-type: none"> <li>~only answers shown</li> <li>~no connection shown</li> </ul>