

# Motion Program of Study (grades 3-5) Timeline

This document is part of an  
Inquiry-based Science Curriculum from  
The *Guided Inquiry supporting Multiple Literacies* Project  
at the *University of Michigan*

## Project Co-Directors:

Annemarie Sullivan Palincsar, Ph.D  
*Literacy and Special Education*

Shirley Magnusson, Ph.D  
*Science Education*

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## Motion Program of Study — TIMELINE

| <i>Cycle</i>              | <i>Days</i> | <i>Time (min.)</i> | <i>Teaching/Learning Activity</i>   |
|---------------------------|-------------|--------------------|---|
| <b>1</b>                  | <b>1</b>    | <b>30</b>          | <b>Scientific Concepts for Understanding Motion</b> (assessment)  |
|                           | <b>2</b>    | <b>30</b>          | <b>Scientific Reasoning about Motion</b> (assessment)   |
|                           | <b>3</b>    | <b>30</b>          | <b>Engagement</b> for the Study of Motion (puzzling phenomenon)   |
|                           |             | <b>45</b>          | <b>Methods of Measuring Motion</b> (adapted from <i>Canned Speed</i> )  |
|                           | <b>4</b>    | <b>15-30</b>       | <b>Prepare for 1<sup>st</sup>-hand Investigation</b> — procedures (e.g., launching cart, measuring time, changing the amount of force, recording data, writing a claim) |
|                           |             | <b>30-45</b>       | <b>1<sup>st</sup>-hand Investigation: influence of <u>force</u> on motion on a level surface</b> — data collection and recording  |
|                           | <b>5</b>    | <b>45-60</b>       | <b>Prepare to Report</b> — data analysis; writing claim(s) and preparing poster w/claims and evidence   |
|                           | <b>6</b>    | <b>45-60</b>       | <b>Report</b> — influence of force on motion of cart; class claims  |
|                           | <b>7</b>    | <b>45-60</b>       | <b>Report (cont.)</b> — influence of force on motion of cart; class claims  |
| <b>2 or 3<sup>1</sup></b> | <b>8</b>    | <b>10-20</b>       | <b>Prepare for 1<sup>st</sup>-hand Investigation</b> — procedures (e.g., changing mass)   |
|                           |             | <b>30-45</b>       | <b>1<sup>st</sup>-hand investigation: influence of <u>mass</u> on motion on a level surface</b> — data collection and recording   |
|                           | <b>9</b>    | <b>30-45</b>       | <b>Prepare to Report</b> — data analysis (including averaging trials, calculating speed); writing claim(s) and preparing poster w/claims and evidence                   |
|                           | <b>10</b>   | <b>45-60</b>       | <b>Report</b> — influence of mass on the motion of an object  |
|                           | <b>11</b>   | <b>45-60</b>       | <b>Report (cont.)</b> — influence of mass on the motion of an object  |

<sup>1</sup> A teacher may choose to conduct only Cycle 2, only Cycle 3 or conduct both cycles. If a teacher choose to conduct both Cycles 2 and 3, the order of the cycles depends on the interests of the students.

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| <i>Cycle</i>  | <i>Days</i> | <i>Time (min.)</i> | <i>Teaching/Learning Activity</i>   |   |
|---------------|-------------|--------------------|---|---|
| <b>2 or 3</b> | <b>(8)</b>  | <b>10-20</b>       | <b>Prepare for 1<sup>st</sup>-hand Investigation</b> — procedures (e.g., changing force)  |   |
|               |             | <b>30-45</b>       | <b>1<sup>st</sup>-hand investigation: influence of <u>mass</u> on motion on a level surface</b> — data collection and recording   |   |
|               | <b>(9)</b>  | <b>30-45</b>       | <b>Prepare to Report</b> — data analysis (including averaging trials, calculating speed); writing claim(s) and preparing poster w/claims and evidence   |   |
|               |             | <b>(10)</b>        | <b>45-60</b>  | <b>Report</b> — influence of force on the motion of an object         |
|               |             | <b>(11)</b>        | <b>45-60</b>  | <b>Report (cont.)</b> — influence of force on the motion of an object |
| <b>4</b>      | <b>12</b>   | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation:</b> notebook text inquiry about the influence of force and mass on motion on a level surface  |   |
|               |             | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on a level surface   |   |
|               |             | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on a level surface   |   |
|               |             | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on a level surface   |   |
|               |             | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on a level surface   |   |
|               |             | <b>45</b>          | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on a level surface   |   |
| <b>5</b>      | <b>18</b>   | <b>30-45</b>       | <b>Prepare for 1<sup>st</sup>-hand Investigation</b> — procedures, average trials, measure time but calculate speed   |   |
|               |             | <b>30-45</b>       | <b>1<sup>st</sup>-hand investigation: <u>relative</u> influence of <u>force</u> and <u>mass</u> on motion on a level surface</b> — data collection and recording; average trials, calculate speed |   |
|               | <b>19</b>   | <b>30-45</b>       | <b>Prepare to Report</b> — data analysis (comparing motion in various contexts); writing claim(s) and preparing poster w/claims and evidence  |   |
|               |             | <b>45-60</b>       | <b>Report</b> — the relative influence of force and mass on motion (speed)  |   |

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| <i>Cycle</i> | <i>Days</i> | <i>Time (min.)</i> | <i>Teaching/Learning Activity</i>   |
|--------------|-------------|--------------------|---|
|              | 20          | 45-60              | <b>Report (cont.)</b> — the relative influence of force and mass on motion (speed)  |
| 6            | 21          | 30-45              | <b>Prepare for 1<sup>st</sup>-hand Investigation</b> — procedures, materials to change frictional force; how to measure force required to overcome friction (to start to move)      |
|              |             | 30-45              | <b>1<sup>st</sup>-hand investigation: influence of friction on motion</b> — data collection and recording; measure frictional force; [ contexts of flat surface and inclined plane] |
|              | 22          | 30-45              | <b>Prepare to Report</b> — data analysis; writing claim(s) and preparing poster w/claims and evidence   |
|              | 23          | 45-60              | <b>Report</b> — the influence of friction on motion   |
|              | 24          | 45-60              | <b>Report (cont.)</b> — the influence of friction on motion   |
| 7            | 25          | 45                 | <b>2<sup>nd</sup>-hand Investigation:</b> notebook text inquiry about the force of gravity and the influence of mass on motion on an inclined plane                                 |
|              | 26          | 45                 | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on an inclined plane   |
|              | 27          | 45-60              | <b>2<sup>nd</sup>-hand Investigation (cont.):</b> notebook text about motion on an inclined plane   |
|              | 28          | 30                 | <b>Scientific Concepts for Understanding Motion</b> (assessment)  |
|              | 29          | 30                 | <b>Scientific Reasoning about Motion</b> (assessment)   |