**Whelk-Come to Mathematics**

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| Why do you think crows consistently fly to a height of about 5 meters before dropping a whelk onto the rocks below? |  |

The figure below left shows the possible flight paths of northwestern crows when they are dropping whelks. The figure below right shows the detail of a whelk, a large marine gastropod (snail) found in temperate waters.

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| --- | --- |
| 1560 paths | 1560 shell |

Consider the dropping of large whelks by northwestern crows.

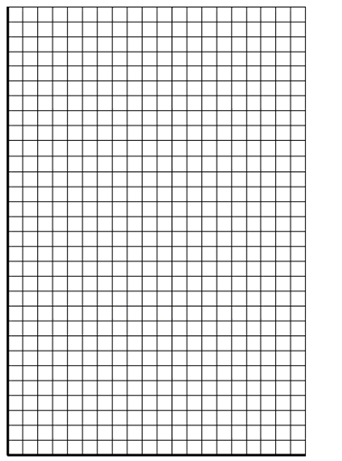
1. Which flight path, A or B, do you think the crows use most? Why?
2. What factors do you think influence the height at which the crows choose to drop the whelk?
3. Do you think there is a minimum or maximum number of drops required to break a whelk?
4. Do you think there is a minimum or maximum height at which a whelk can be dropped to break?
5. We are going to perform an experiment to model this action. Each group will collect and analyze data using peanuts as whelks.
   * First you will collect data for the height specified. You will need to drop your “whelk” eight times and average your number of drops to share with the class.

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| Height | Trial | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Average |
| Number of Drops |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Height | Trial | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Average |
| Number of Drops |  |  |  |  |  |  |  |  |  |

1. Once the entire class has their data we are going to share data so that we can get an accurate equation for our situation.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Height of Drop | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| Number of Drops |  |  |  |  |  |  |  |  |  |



1. Sketch a possible graph of the number of drops required to break a whelk as a function of the height of the drop on the graph below. Label your x and y axis.

1. Does your graph appear to have any asymptotes? If so where?
2. Come up with a model that could fit your data using your knowledge of hyperbolas and inverse functions.
3. Do you think there is a minimum number of drops required to break open a peanut?
4. Do you think there is a minimum height required to break open a peanut?