Grading the Graphics *M002 scoring rubric*

Math Domain

☐ Number/Quantity	☐ Shape/Space	☐ Function/Pattern
☑ Chance/Data	☐ Arrangement	

Math Actions (possible weights: 0 through 4)

1 Modeling/Formulating	1 Manipulating/Transforming
3 Inferring/Drawing Conclusions	3 Communicating

Math Big Ideas

☐ Scale	☐ Reference Frame	☑ Representation
☐ Continuity	☐ Boundedness	☐ Invariance/Symmetry
☑ Equivalence	☐ General/Particular	☐ Contradiction
☐ Use of Limits	☐ Approximation	☐ Other

1. Most importantly, students should recognize that the depictions of Norway, Greece and Canada have twice as many figures as they should.

Some may also suggest that the key for the pictograph should be more clearly displayed. Another reasonable comment is that the depiction of the 290,00 "Not accounted for" is not as compelling as it would be if it were printed in a more vertical presentation.

2. In addition to identifying that the graphic depicts the year plotted against world population in billions, statements which could be included in the description are:

- it took almost 125 years for the population to first double, but only 50 years for the second "doubling".
- the current pattern is that the world has added 1 billion people about every 12 years since 1974.
- the slope of the line starts off slowly as linear growth, but around 1960 (The Baby Boom years) it became exponential.
- population growth slowed between 1927 and 1960 due to the two World Wars.

3. Since the countries which are keyed as having either a net population loss, or 3% and greater population growth are not a significant portion of the graphic, it is not possible for either the population to double by 2020, or to remain stable for the next 20 years. It is therefore reasonable to choose as the headline "World Population To Approach 7 billion by 2015", as the majority of the countries portrayed in the graphic are experiencing 1-3% population growth. This also corresponds to the rate of growth shown in the graphic for question **2**.

	partial level (1 or 2)	full level (3)
Modeling/ Formulating (weight: 1)	Student is only partially successful in devising a strategy to analyze the graphic in question **3**.	Student is completely successful in devising a strategy to answer question **3**.
Transforming/ Manipulating (weight: 1)	Student is able to numerically interpret some of the data presented in the graphics.	Student is able to numerically interpret all of the data presented in the graphics.
Inferring/ Drawing Conclusions (weight: 3)	Student is able to draw conclusions from one or two of the given graphics.	Student is able to draw correct conclusions from all three graphics.
Communicating (weight: 3)	Prose explanations are unclear or incomplete. Answer to question **2** is limited to a point-by-point identification of the plot of the graph.	All prose explanations are clear, complete, and coherently expressed.