Standard #: MAFS.8.EE.1.3

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Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, *estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9*, and determine that the world population is more than 20 times larger.

General Information

Subject Area: Mathematics	**Grade:** 8
Domain-Subdomain: Expressions & Equations	**Cluster:** Level 1: Recall
Cluster: Work with radicals and integer exponents. (Major Cluster) - Clusters should not be sorted from Major to Supporting and then taught in that order. To do so would strip the coherence of the mathematical ideas and miss the opportunity to enhance the major work of the grade with the supporting clusters.	**Date Adopted or Revised:** 02/14
Content Complexity Rating: Level 1: Recall - More Information	**Date of Last Rating:** 02/14
Status: State Board Approved	**Assessed:** Yes

Test Item Specifications

N/A
Assessment Limits :
N/A

Calculator :
No

Context :
Allowable

Sample Test Items (2)

Test Item #: Sample Item 1
Question:
The average mass of a giraffe is approximately 1×10^3 kilograms. The average mass of a blue whale is approximately 2×10^6.

About how many times more mass does a blue whale have than a giraffe?

Difficulty: N/A
Type: EE: Equation Editor

Test Item #: Sample Item 2
Question:
The average mass of an ant is approximately 3×10^{-3} grams. The average mass of a giraffe is approximately 2×10^3 kilograms.

About how many times more mass does a giraffe have than an ant?

Difficulty: N/A
Type: EE: Equation Editor

Related Courses

Course Number	Course Title
1205050:	M/J Accelerated Mathematics Grade 7 (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1205070:	M/J Grade 8 Pre-Algebra (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
1204000:	M/J Intensive Mathematics (MC) (Specifically in versions: 2014 - 2015, 2015 and beyond (current))
7812030:	Access M/J Grade 8 Pre-Algebra (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2019, 2019 and beyond (current))

Related Access Points

Access Points Number	Access Points Title
MAFS.8.EE.1.AP.3a:	Multiply single digits by the power of 10 using a calculator.
MAFS.8.EE.1.AP.3b:	Identify the products of powers of 10 (through 10^8).

Related Resources

Assessments

Name	Description
Sample 4 - Eighth Grade Math State Interim Assessment:	This is a State Interim Assessment for eighth grade.
Sample 1 - Eighth Grade Math State Interim Assessment:	This is a State Interim Assessment for eighth grade.

Formative Assessments

Name	Description
Estimating Length Using Scientific Notation:	This lesson unit is intended to help you assess how well students are able to: • Estimate lengths of everyday objects. • Convert between decimal and scientific notation. • Make comparisons of the size of numbers expressed in both decimal and scientific notation.
Estimating Extreme Values:	Students are asked to estimate an extremely large and an extremely small number by writing it in the form a x ___ .
Order Matters:	Students are given pairs of numbers written in the form of an integer times a power of 10 and are asked to compare the numbers in each pair using the inequality symbols.
How Many Times?:	Students are given pairs of numbers written in exponential form and are asked to compare them multiplicatively.
Compare Numbers:	Students are given pairs of numbers written in scientific notation and are asked to compare them multiplicatively.

Lesson Plan

Name	Description
Estimating Length Using Scientific Notation:	This lesson unit is intended to help you assess how well students are able to estimate lengths of everyday objects, convert between decimal and scientific notation and make comparisons of the size of numbers expressed in both decimal and scientific notation.

Problem-Solving Tasks

Name	Description
Pennies to Heaven:	The goal of this task is to give students a context to investigate large numbers and measurements. Students need to fluently convert units with very large numbers in order to successfully complete this task. The total number of pennies minted either in a single year or for the last century is phenomenally large and difficult to grasp. One way to assess how large this number is would be to consider how far all of these pennies would reach if we were able to stack them one on top of another: this is another phenomenally large number but just how large may well come as a surprise.
Ant and Elephant:	In this problem students are comparing a very small quantity with a very large quantity using the metric system. The metric system is especially convenient when comparing measurements using scientific notations since different units within the system are related by powers of ten.

Student Center Activity

Name	Description
Edcite: Mathematics Grade 8:	Students can practice answering mathematics questions on a variety of topics. With an account, students can save their work and send it to their teacher when complete.

Student Resources

Problem-Solving Task

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Parent Resources

Problem-Solving Tasks

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