



America's Greatest History Attraction

CURRICULUM CONNECTIONS

NASCAR 3D Educator's Guide

Educator guide to the IMAX film *NASCAR 3D*.

Common Core State Standards for Mathematics

Grade 6

- 6.RP.3.** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- b.** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
 - d.** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
- 6.SP.5** Summarize numerical data sets in relation to their context, such as by:
- b.** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
 - c.** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- 6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.*

High School – Functions

- F-IF.2** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

Common Core State Standards for English Language Arts

Grade 4

- RI.4.3** Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- RI.4.4** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

- L.4.4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 4 reading and content*, choosing flexibly from a range of strategies.
- W.4.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
- Grade 5**
- RI.5.3** Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- RI.5.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.
- L.5.4** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 5 reading and content*, choosing flexibly from a range of strategies.
- W.5.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
- Grade 6**
- RI.6.4** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.
- L.4.6** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 6 reading and content*, choosing flexibly from a range of strategies.
- W.6.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Common Core State Standards for Literacy in Science and Technical Subjects

Grades 6-8

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts.
- WHST.6-8.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- WHST.6-8.10** Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

National Curriculum Standards for Science

- B. Physical science
- E. Science and technology

Michigan Math Grade Level Content Expectations

Grade 4

- D.RE.04.02** Order a given set of data, find the median, and specify the range of values.
- N.MR.04.14** Solve contextual problems involving whole number multiplication and division.
- M.TE.04.05** Carry out the following conversions from one unit of measure to a larger or smaller unit of measure: meters to centimeters, kilograms to grams, liters to milliliters, hours to minutes, minutes to seconds, years to months, weeks to

days, feet to inches, ounces to pounds (using numbers that involve only simple calculations).

Grade 5

D.AN.05.03 Given a set of data, find and interpret the mean (using the concept of fair share) and mode.

Grade 6

A.PA.06.01 Solve applied problems involving rates, including speed, e.g., if a car is going 50 mph, how far will it go in 300 hours?

Grade 7

N.MR.07.02 Solve problems involving derived quantities such as density, velocity, and weighted averages.

N.MR.07.04 Convert ratio quantities between different systems of units, such as feet per second to miles per hour.

N.FL.07.03 Calculate rates of change including speed.

N.FL.07.05 Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation $a/b = c/d$; know how to see patterns about proportional situations in tables.

A.PA.07.04 For directly proportional or linear situations, solve applied problems using graphs and equations, e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.

Michigan English Language Arts Grade Level Content Expectations

Grade 4

R.WS.04.07 In context, determine the meaning of words and phrases including similes, metaphors, content vocabulary, and literary terms using strategies and resources including context clues, semantic feature analysis, and a thesaurus.

R.CM.04.01 Connect personal knowledge, experiences, and understanding of the world to themes and perspectives in text through oral and written responses.

R.CM.04.02 Retell through concise summarization grade-level narrative and informational text.

R.CM.04.04 Apply significant knowledge from grade-level science, social studies, and mathematics texts.

Grade 5

R.WS.05.07 In context, determine the meaning of words and phrases including symbols, idioms, recently coined words, content vocabulary, and literary terms using strategies and resources including analogies, content glossaries, and electronic resources.

R.CM.05.01 Connect personal knowledge, experiences, and understanding of the world to themes and perspectives in text through oral and written responses.

R.CM.05.02 Retell through concise summarization grade-level narrative and informational text.

R.CM.05.04 Apply significant knowledge from grade-level science, social studies, and mathematics texts.

Grade 6

R.WS.06.07 In context, determine the meaning of words and phrases including regional idioms, literary and technical terms, and content vocabulary using strategies including connotation, denotation, and authentic content-related resources.

- R.CM.06.01** Connect personal knowledge, experiences, and understanding of the world to themes and perspectives in text through oral and written responses.
- R.CM.06.02** Retell through concise summarization grade-level narrative and informational text.
- R.CM.06.04** Apply significant knowledge from grade-level science, social studies, and mathematics texts.

Michigan Science Grade Level & High School Content Expectations

Grade 4

- S.RS.04.16** Identify technology used in everyday life.

Grade 5

- P.FM.05.42** Describe the motion of an object in terms of distance, time and direction, as the object moves, and in relationship to other objects.

Grades 9-12 Physics

- P2.1A** Calculate the average speed of an object using the change of position and elapsed time.
- P2.2A** Distinguish between the variables of distance, displacement, speed, velocity, and acceleration.
- P2.2B** Use the change of speed and elapsed time to calculate the average acceleration for linear motion.
- P3.1A** Identify the force(s) acting between objects in “direct contact” or at a distance.
- P3.1d** Identify the basic forces in everyday interactions.
- P3.2B** Compare work done in different situations.
- P3.2C** Calculate the net force acting on an object.
- P3.3b** Predict how the change in velocity of a small mass compares to the change in velocity of a large mass when the objects interact (e.g., collide).
- P3.4A** Predict the change in motion of an object acted on by several forces.
- P3.4B** Identify forces acting on objects moving with constant velocity (e.g., cars on a highway).
- P3.4C** Solve problems involving force, mass, and acceleration in linear motion (Newton’s second law).
- P3.4D** Identify forces acting on objects moving with uniform circular motion (e.g., cars on a circular track).
- P4.1c** Explain why work has a more precise scientific meaning than the meaning of work in everyday language.
- P4.1d** Calculate the amount of work done on an object that is moved from one position to another.