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Michigan Standards - Fourth Grade Mathematics	Math Word Problems
Patterns, Relationships and Functions	
Patterns	✓
Student recognize similarities & generalized patterns, use patterns to create models & make predictions, describe the nature of patterns & relationships, & construct representations of mathematical relationships	✓
recognize, describe, & extend numerical & geometric patterns	
represent and record patterns & relationships in a variety of ways	
including tables, charts and pictures	
Use patterns to describe real world phenomena	✓
Explore various types of patterns (repeating, growing, shrink)	✓
Apply their experiences with patterns to help solve problems	✓
and explore new content	
Variability and Change	
Students describe the relationships among variables, predict what will happen to one variable as another variable is changed, & compare patterns of change	✓
Recognize change when it occurs in a variety of settings	✓
Recognize that change is often predictable & that patterns	
emerge that help to describe change	

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Michigan Standards - Fourth Grade Mathematics	Math Word Problems
Explore change, & realize that change is frequently interdependent	✓
Use tables, charts, open sentences, & hands-on models to	
physically represent change	
Begin to describe & differentiate between types of relationships	
growing, repeating, shrinking patterns	
begin to explore relationships in various contexts & see that	
patterns help to solve mathematical problems	
GEOMETRY AND MEASUREMENT	
Shapes & Shape Relationships	
Students develop spatial sense, identify characteristics & define shapes, identify properties & describe relationships among shapes	
Recognize & name familiar shapes in one, two & three dimensions	
lines, rectangles, & spheres & informally discuss the shape of	
a graph	
Describe the attributes of familiar shapes	
Compare, sort, & classify familiar shapes	
Draw and build familiar shapes	
Explore ways to combine, dissect, & transform shapes	

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Michigan Standards - Fourth Grade Mathematics	Math Word Problems
Recognize parallel & perpendicular line segments & figures that have similarity and/or congruence	
Use concepts of shapes & their properties & relationships as studied at the elementary level to describe the physical world & to solve problems	
Position	
Students identify locations of objects, identify location relative to other objects, & describe the effects transformations on an object	
Locate & describe objects in terms of their position-front, back inside, outside, right, left, over, under, next to, between &	
locations on the number line, or coordinate graph & on a map	
Locate & describe objects in terms of their orientation, direction & position, down, front, back, NSEW, flipped turned, translated;	
recognize symmetrical objects & identify their lines of symmetry	
Explore what happens to the size, shape & position of an object after sliding, flipping, turning, enlarging, or reducing it	
Use concepts of position, direction, & orientation to describe the physical world & to solve problems	

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Measurement	
Students compare attributes of two objects, or of one object with a standard (unit), & analyze situations to determine what measurement(s) should be made & to what level of precision	
Measure common objects by comparing them to other objects, to	
non-standard units & to standard units & order objects according	
to their size	
Identify the attribute to be measured & select the appropriate unit	
of measurement for length, mass (weight) area, perimeter,	
capacity, time, temperature, & money	
Develop strategies for estimating measures & compare the	
estimates to the results of the measurement; decide if an	
estimate is "a good estimate"	
Develop & use their own measuring units & tools, & progress to	
selecting & using standard tools for measurement	
Explain the meaning of measurements & recognize that the number	
of units it takes to measure an object is related to the size of the	
unit	
Explore scale drawings, models, & maps & relate them to	
measurements of real objects	
Apply measurement to describe the real world & to solve problems	

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DATA ANALYSIS AND STATISTICS	
Collection, Organization & Presentation of Data	
Students collect & explore data, organize data into a useful form, & develop skill in representing & reading data displayed in different formats	
Collect & explore data through observation, measurement,	
conducting surveys and experiments	
Organize data using concrete objects, pictures, tallies, tables,	
charts, diagrams, and graphs	
Present data using a variety of appropriate representations & explain	
the meaning of the data	
Identify what data are needed to answer a particular question or	
solve a given problem, use objects, pictures, tallies, tables, charts,	
diagrams, & graphs & design & implement strategies to obtain,	
organize, present those data	
Description & Interpretation	
Students examine data & describe characteristics of a distribution, relate data to the situation from which they arose, & use data to answer questions convincingly and persuasively	
Read & explain data they have collected organized themselves &	
progress to reading data from other sources	

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Raise & answer questions about data & how the data were collected	
represented, & how their explorations led to new questions	
Describe the shape of the data using informal language	
Draw, explain, & justify conclusions & trends based on data	
Explore bias by discussing problems they encounter when they	
collect data	
Formulate questions & problems, & gather & interpret data to	
answer those questions	
Inference and Prediction	
Students draw defensible inferences about unknown outcomes, make predictions, & identify the degree of confidence they have in their predictions	
Make and test hypotheses	
Conduct surveys, samplings, & experiments to solve problems &	
answer questions of interest to them	
Formulate & communicate arguments & conclusions based on data,	
& evaluate their arguments & those of others	
Make and explain predictions based on data	
Make predictions to answer questions & solve problems	

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NUMBER SENSE AND NUMERATION	
Concepts and Properties of Numbers	
Students experience counting and measuring activities to develop intuitive sense about numbers, develop understanding about properties of numbers, understand the need for & existence of different sets of numbers, & investigate properties of special numbers	✓
Develop an understanding of whole numbers, & read, write, & count using whole numbers; investigate basic concepts of fractions and	✓
decimals	
Investigate & develop an understanding of numeration systems, in particular the base-10 place-value system	✓
Develop an understanding of the properties of numbers & of the properties of the special numbers 0 & 1	✓
Apply their understanding of number systems to model & solve problems	✓
Representation and Uses of Numbers	
Students recognize that numbers are used in different ways such as counting, measuring, ordering and estimating, understand & produce multiple representations of a number, & translate among equivalent representations	✓
Represent whole numbers, fractions & decimals using concrete, pictorial, & symbolic representations	✓

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Michigan Standards - Fourth Grade Mathematics	Math Word Problems
Explore & recognize understanding different representations for the same number & explain why they are the same	
Investigate ways numbers are used (counting, ordering, naming,	✓
Develop strategies for estimating quantity and evaluate the reasonableness of their estimates	
Select appropriate numbers & representations in order to solve problems	✓
Number Relationships	
Students investigate relationships such as equality, inequality, inverses, factors & multiples, & represent & compare very large & very small numbers	✓
Compare and order numbers using "equal", "less than" or "greater than"	✓
Use part-whole relationships to explore numbers, develop number concepts, & understand computation	
Classify numbers as even or odd explore concepts of factors & multiples	✓
Apply their understanding of number relationships in solving problems	✓

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NUMERICAL & ALGEBRAIC OPERATIONS & ANALYTICAL THINKING	
Operations and Their Properties	
Students understand & use various types of operations to solve problems	✓
Use manipulative to model operations with numbers; develop their	✓
own methods of recording operations; & relate their models &	
recordings to standard symbolic expressions & algorithms	
Select & apply the appropriate method of computation from among	✓
mental computation, estimation, paper-&-pencil or calculators;	
explain what they are doing & know which operations to perform in	
a given situation	
Explore properties of operations & give examples of how they use	✓
those properties	
Apply operations efficiently & accurately in solving problems	✓
Algebraic and Analytic Thinking	
Students analyze problems to determine an appropriate process for solution, & use algebraic notations to model or represent problems	
Write & solve open sentences & write stories to fit the open sentence	

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Explore algebraic concepts with manipulative such as balance	
scales, tables of input, & out put, & pictorial representations of problems	
Find replacements for open sentences	
Use analytic thinking & algebraic models & representations to	
describe situations & solve problems	
PROBABILITY AND DISCRETE MATHEMATICS	
Probability	
Students develop an understanding of the notion of certainty & of probability as a measure of the degree of likelihood that can be assigned to a given event based on the knowledge available, & make critical judgments about claims that are made in probabilistic situations	
Explain the difference between chance & certainty & give examples	
to illustrate their understanding	
Compare events & describe them as "more likely" or "less Likely"	
use the language of fractions to describe simple probabilities	
Conduct experiments with concrete objects to explore concepts &	
develop an intuitive understanding of how the conditions of the	
experiment can affect the outcome	
Conduct experiments, record the outcomes, examine those	
outcomes to determine if they make sense, & search for explanation of the outcomes	
Conduct probability experiments & simulations to model & solve problems	

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Students investigate practice situations such as scheduling, routing, sequencing, networking, organizing & classifying, and analyze ideas like recurrence relations, induction, iteration	
Use manipulative, diagrams, & the fundamental theorem of	
counting to count permutations & combinations	
Use sets & set relationships to explore & solve simple algebraic &	
geometric problems	
Solve problems involving networks, planning delivery routes	
Continue to use manipulative & drawing to model the concepts &	
procedures for the standard arithmetic algorithms, & develop &	
analyze their own & other students' algorithms to accomplish a	
task or solve a mathematical problem	
Use discrete mathematics concepts as described above to model	
situations & solve problems; & look for whether or not there is a	
solution, determine how many solutions there are, & decide upon	
a best solution.	