



Online and At-Home Math Resource Sheet

With the social distancing and closure of school sites as recommended by the Centers for Disease Control and various local Departments of Health, the Kansas Association of Teachers of Mathematics (KATM) board offers the following list of resources to teachers and guardians. For many teachers instruction will resume at (near) scheduled times and the learning will shift from class-centric to home-centric. Schools opting for extended breaks instead of shifting to online learning means guardians will have the opportunity to take on the role of “math teacher” - and we sincerely hope they give it a try! (We bet both guardians and their students will learn much this way.) In either situation, the items below will hopefully be of value.

The form is separated into grade bands along the left and by learning experience along the top. Every grade band has at least one item listed in each learning experience type.

KATM wants all parties to extract the most from this document. We will note here that this document has been neither vetted nor assembled as a complete curriculum. We would also be remiss if we did not remind teachers that this is a time of relative tumult and disruption. Students, especially those in delicate situations under normal circumstances, may be facing increased pressures and uncertainty. Heads are taught only after hearts are secure, so we encourage heightened patience and understanding. If you need additional guidance or support, you are welcomed and encouraged to contact the board through its president, Dr. Janet Stramel, at janetstramel@katm.org. We look forward to serving our members through this unique experience.

Sincerely,
The KATM Board

Grade Band	Type of Learning Experience				
	<i>Curricular Math</i>	<i>Math Discussions</i>	<i>Problem Solving</i>	<i>Open Exploration/ Informational</i>	<i>Games/Play</i>
K - 3	<p>PBS Learning Media There are a variety of videos and interactive activities related to all math content areas organized by grade level.</p>	<p>Would You Rather? Math There are questions posed in four grade bands (K-2, 3-5, 6-8, and 9-12). The goal is to choose the better of two options, and defend/justify your choice mathematically. There is no “answer sheet.”</p>	<p>Open Middle There are tasks for students from K-HS in different math focus areas. The tasks start with specific beginnings and specific endings, but with multiple ways to approach the problem allowing students to forge their own path/method to solve the problem. It is not online. Students solve using paper/pencil. There are hints and some answers given.</p>	<p>Math Playground A variety of math games available for elementary grade levels covering various topics.</p>	<p>Games for Young Minds There are suggestions on how to make classic games more mathematical. There are free games and ideas about working on math skills at home. Some games are not free..</p>
	<p>Edpuzzle Teachers can upload videos (self-made or found on the internet) and embed questions. Students answer as they watch. Analytics exist to view student engagement and performance.</p>	<p>Which One Doesn't Belong? Choose which one of four options “doesn’t belong”. Explain why. There are four categories of problems: Shapes, Numbers, Graphs & Equations, and Incomplete Sets. In each case the students choose which one of four options “doesn’t belong”. Explain why. The problems do not go in order of difficulty. There is no answer guide because there are multiple correct answers.</p>	<p>Gfletchy.com These 3-act tasks help students apply the mathematical concepts they are learning to their lives. After completing some of these, students could even create their own 3-act tasks and share virtually with their classmates!</p>	<p>ABCya.com A variety of math games available for elementary grade levels covering various topics.</p>	<p>Greg Tang Math Games Online Game options and Teaching Game options for elementary grades.</p>



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of Mathematics

	<p>Illustrative Mathematics Search engine for all of the common core domains and standards in grades K -HS. Along with each standard there is an explanation of the concepts and tasks for each.</p>	<p>Math Before Bed Simple pictures and questions to use to talk about math and to think mathematically at home. There is an example of a question and discussion under Start Here.</p>	<p>Youcubed.org find a number of great tasks that are real-world. The site offers great other resources for all grade levels. Under News there are newsletters that give good information about math at home.</p>	<p>National Library of Virtual Manipulatives Provides access to manipulatives in virtual form.</p>	<p>Prodigy Fun games to practice a variety of math skills.</p>
		<p>Same But Different It is important to read the Steps to Use under the heading About. Students analyze two situations, comparing what is the same about them and what is different between them. It is optimum to have a group discussion but not imperative.</p>	<p>NRICH There is a little reading to it, but if you pick a topic, you get links to many online activities. Some of the wording may be helpful to share with parents/students as they are learning new concepts.</p>		<p>Illuminations NCTM Although membership in NCTM gives you full use of this resource there are many interactives that you can use for free. Under Interactive you can search by grade band. There are many interactives</p>
			<p>Solve Me--The Who Am I? Puzzles are really great to get students thinking about numbers. Puzzles get progressively more difficult.</p>		<p>Polyup Interactive activities that encourage computation thinking</p>
					<p>Splat! Students are shown representations of numbers. A "splat" is put over part of the representation, so part of the representation is hidden. Students are asked how many are still shown and asked to reason through how many are hidden.</p>



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	Curricular Math	Math Discussions	Problem Solving	Open Exploration/ Informational	Games/Play
4 - 5	<p>PBS Learning Media There are a variety of videos and interactive activities related to all math content areas organized by grade level.</p>	<p>Would You Rather? Math There are questions posed in four grade bands (K-2, 3-5, 6-8, and 9-12). The goal is to choose the better of two options, and defend/justify your choice mathematically. There is no "answer sheet."</p>	<p>Open Middle There are tasks for students from K-HS in different math focus areas. The tasks start with specific beginnings and specific endings, but with multiple ways to approach the problem allowing students to forge their own path/method to solve the problem. It is not online. Students solve using paper/pencil. There are hints and some answers given.</p>	<p>Math Playground A variety of math games available for elementary grade levels covering various topics</p>	<p>Games for Young Minds There are suggestions on how to make classic games more mathematical. There are free games and ideas about working on math skills at home. Some games are not free.</p>
	<p>Estimation 180 Students use estimation skills based on visual clues. There are three sections: Days, Lessons, and Clothesline Activities. Each provides guidance and builds towards good estimation and number sense.</p>	<p>Which One Doesn't Belong? Choose which one of four options "doesn't belong". Explain why. There are four categories of problems: Shapes, Numbers, Graphs & Equations, and Incomplete Sets. In each case the students choose which one of four options "doesn't belong". Explain why. The problems do not go in order of difficulty. There is no answer guide because there are multiple correct answers.</p>	<p>Robert Kaplinsky A wide variety of problem-solving lessons based on real life math scenarios.</p>	<p>Shodor A website with a wide variety of math games and simulations covering various topics.</p>	<p>Greg Tang Math Games Online Game options and Teaching Game options for elementary grades..</p>
	<p>Edpuzzle Teachers can upload videos (self-made or found on the internet) and embed questions. Students answer as they watch. Analytics exist to view student engagement and performance.</p>	<p>Same But Different It is important to read the Steps to Use under the heading About. Students analyze two situations, comparing what is the same about them and what is different between them. It is optimum to have a group discussion but not imperative.</p>	<p>Gfletchy.com These 3-act tasks help students apply the mathematical concepts they are learning to their lives. After completing some of these, students could even create their own 3-act tasks and share virtually with their classmates!</p>	<p>National Library of Virtual Manipulatives Provides access to manipulatives in virtual form.</p>	<p>Prodigy Fun games to practice a variety of math skills.</p>



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of Mathematics

	<p>Illustrative Mathematics Search engine for all of the common core domains and standards in grades K -HS. Along with each standard there is an explanation of the concepts and tasks for each.</p>	<p>Math Before Bed Simple pictures and questions to use to talk about math and to think mathematically at home. There is an example of a question and discussion under Start Here.</p>	<p>Youcubed.org find a number of great tasks that are real-world. The site offers great other resources for all grade levels. Under News there are newsletters that give good information about math at home.</p>		<p>Illuminations NCTM Although membership in NCTM gives you full use of this resource there are many interactives that you can use for free. Under Interactive you can search by grade band. There are many interactives</p>
			<p>NRICH There is a little reading to it, but if you pick a topic, you get links to many online activities. Some of the wording may be helpful to share with parents/students as they are learning new concepts.</p>		<p>Polyup Interactive activities that encourage computation thinking</p>
			<p>Solve Me--The Who Am I? Puzzles are really great to get students thinking about numbers. Puzzles get progressively more difficult.</p>		<p>Skyscrapers One person game (though it can be done as a small team). Players are given a grid with numbers along the sides. Across each row and column, the number specifies how many skyscrapers can be seen from that vantage (smaller skyscrapers cannot be seen behind taller ones). Players use blocks to build the skyscrapers that satisfy each row and column.</p>
					<p>Splat! Students are shown representations of numbers. A "splat" is put over part of the representation, so part of the representation is hidden. Students are asked how many are still shown and asked to reason through how many are hidden.</p>
	Curricular Math	Math Discussions	Problem Solving	Open Exploration/	Games/Play



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				Informational	
Middle School	<p>Estimation 180 Students use estimation skills based on visual clues. There are three sections: Days, Lessons, and Clothesline Activities. Each provides guidance and builds towards good estimation and number sense.</p>	<p>Would You Rather? Math There are questions posed in four grade bands (K-2, 3-5, 6-8, and 9-12). The goal is to choose the better of two options, and defend/justify your choice mathematically. There is no "answer sheet."</p>	<p>Figure This Take a Challenge! has sets of 4 challenge problems per page. For each there is a Hint, Getting Started, and the Solution.</p>	<p>Peter Liljedahl's Good Questions Good math questions that invite student thinking. Very open to student-defined paths to successful resolution.</p>	<p>Games for Young Minds There are suggestions on how to make classic games more mathematical. There are free games and ideas about working on math skills at home. Some games are not free.s.</p>
	<p>Desmos.com (Activity Library) Guided online activities that promote student sensemaking. Graphing and equation writing abound. Going to Classroom Activities and then most popular would be a great way to start.</p>	<p>Which One Doesn't Belong? Choose which one of four options "doesn't belong". Explain why. There are four categories of problems: Shapes, Numbers, Graphs & Equations, and Incomplete Sets. In each case the students choose which one of four options "doesn't belong". Explain why. The problems do not go in order of difficulty. There is no answer guide because there are multiple correct answers.</p>	<p>Open Middle There are tasks for students from K-HS in different math focus areas. The tasks start with specific beginnings and specific endings, but with multiple ways to approach the problem allowing students to forge their own path/method to solve the problem. It is not online. Students solve using paper/pencil. There are hints and some answers given.</p>	<p>Math Playground A variety of Math Games, Logic Games, Math Arcade, and Story Math available for elementary grade levels covering. Interactive with solutions shared.</p>	<p>Prodigy Fun games to practice a variety of math skills</p>
	<p>PBS Learning Media There are a variety of videos and interactive activities related to all math content areas organized by grade level.</p>	<p>Same But Different It is important to read the Steps to Use under the heading About. Students analyze two situations, comparing what is the same about them and what is different between them. It is optimum to have a group discussion but not imperative.</p>	<p>Solve Me Puzzles These include mobiles (algebraic thinking), who am I? (number puzzles) and mystery grid (logical thinking). There are three levels of mobiles: Explorer, Puzzler, and Master. Each level has multiple puzzles and increases in difficulty. Good visual puzzles that encourage algebraic thinking. The who am I? Puzzles also come in many levels, and encourage students to think about numbers as well as vocabulary.</p>	<p>Math Interactives A variety of interactive math activities and videos related to multiple middle school topics including Number, Patterns/Relationship, Shapes/Space, and Statistics/Probability</p>	<p>Illuminations NCTM Although membership in NCTM gives you full use of this resource there are many interactives that you can use for free. Under Interactive you can search by grade band. There are many interactives</p>



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of Mathematics

	<p>Graphing Stories Short videos help students connect graphs with a real-life situations</p>		<p>3-Act Tasks See the list of tasks. The tasks include a hook that engages/elicits questions, an opportunity to resolve the questions, and a conclusion to check against student work.</p>	<p>Phet Go to Math. Then you may choose either concepts or applications. Both have a variety of interactive simulations related to Number topics, Algebra, Probability and more.</p>	<p>Hour of Code. There are lots of different Hour of Code activities...some are more math-centered, but all require students to use problem solving skills. The Frozen Hour of Code activity is a great introduction to coding and draws on student knowledge of angles. No coding experience required!</p>
	<p>Edpuzzle Teachers can upload videos (self-made or found on the internet) and embed questions. Students answer as they watch. Analytics exist to view student engagement and performance.</p>		<p>MathCounts Under Resources there are a series of Problems of the Week and Videos on math content areas. Sign up for a free account to get access to a wide variety of problems and solutions to high-level math problem solving.</p>	<p>Shodor A website with a wide variety of math games and simulations covering various topics.</p>	<p>Math Snacks. Animations and games are available over a variety of middle school math topics.</p>
	<p>Illustrative Mathematics Search engine for all of the common core domains and standards in grades K -HS. Along with each standard there is an explanation of the concepts and tasks for each.</p>		<p>Robert Kaplinsky A wide variety of problem-solving lessons based on real life math scenarios.</p>	<p>Math for Grown Ups Under the heading Math for Parents you will find the Math at Work Monday series, where the author interviews people in a variety of professions about how they use math. There is also a section on "Why Math?"</p>	<p>Polyup Interactive activities that encourage computation thinking</p>
			<p>Visual Patterns</p>	<p>New York Times Graph of the</p>	<p>Skyscrapers</p>



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of Mathematics

			Pictorial patterns are presented. Learners examine how the patterns change, and articulate that growth multiple ways (including formulaically).	Day A different graph posted each day gives students opportunities to see statistics in the real world and analyze the message of a graph	One person game (though it can be done as a small team). Players are given a grid with numbers along the sides. Across each row and column, the number specifies how many skyscrapers can be seen from that vantage (smaller skyscrapers cannot be seen behind taller ones). Players use blocks to build the skyscrapers that satisfy each row and column.
			Youcubed.org find a number of great tasks that are real-world. The site offers great other resources for all grade levels. Under News there are newsletters that give good information about math at home.	Vi Hart You Tube Channel These videos give a different and interesting perspective on how math shows up in the world. Her math doodle videos are fun!	Splat! Students are shown representations of numbers. A "splat" is put over part of the representation, so part of the representation is hidden. Students are asked how many are still shown and asked to reason through how many are hidden.
				Pixar in a Box Great resource about all different aspects of animation from Pixar, both math related as well as other fields	
				National Library of Virtual Manipulatives Provides access to manipulatives in virtual form.	



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High School	<p>Desmos.com (Activity Library) Guided online activities that promote student sensemaking. Graphing and equation writing abound. Going to Classroom Activities and then most popular would be a great way to start.</p>	<p>Would You Rather? Math There are questions posed in four grade bands (K-2, 3-5, 6-8, and 9-12). The goal is to choose the better of two options, and defend/justify your choice mathematically. There is no “answer sheet.”</p>	<p>Open Middle There are tasks for students from K-HS in different math focus areas. The tasks start with specific beginnings and specific endings, but with multiple ways to approach the problem allowing students to forge their own path/method to solve the problem. It is not online. Students solve using paper/pencil. There are hints and some answers given.</p>	<p>Peter Liljedahl’s Good Questions Go to the “For Teachers” tab and click on it. Under the cartoon there are Numeracy Tasks, Card Tricks, and Good Problems. Numeracy Tasks have problems for grade bands on K - HS. Card Tasks has youtube videos for students to watch and potentially perform. Good Problems questions invite student thinking and are very open to student-defined methods to successful solutions.</p>	<p>Hooda Math Online games to practice various high school math skills and procedures. There is no fee if you do not mind ads. For a \$2 annual fee you can use the games ad fee.</p>
	<p>Graphing Stories Short videos help students connect graphs with a real-life situations</p>	<p>Which One Doesn’t Belong? Choose which one of four options “doesn’t belong”. Explain why. There are four categories of problems: Shapes, Numbers, Graphs & Equations, and Incomplete Sets. In each case the students choose which one of four options “doesn’t belong”. Explain why. The problems do not go in order of difficulty. There is no answer guide because there are multiple correct answers.</p>	<p>Solve Me Mobiles There are three levels of mobiles: Explorer, Puzzler, and Master. Each level has multiple puzzles and increases in difficulty. Good visual puzzles that encourage algebraic thinking.</p>	<p>Shodor A website with a wide variety of math games and simulations covering various topics.</p>	<p>Illuminations NCTM Although membership in NCTM gives you full use of this resource there are many interactives that you can use for free. Under Interactive you can search by grade band. There are many interactives.</p>
	<p>Edpuzzle Teachers can upload videos (self-made or found on the internet) and embed questions. Students answer as they watch. Analytics exist to view student engagement and performance.</p>	<p>Same But Different It is important to read the Steps to Use under the heading About. Students analyze two situations, comparing what is the same about them and what is different between them. It is optimum to have a group discussion but not imperative.</p>	<p>3-Act Tasks See the list of tasks. The tasks include a hook that engages/elicits questions, an opportunity to resolve the questions, and a conclusion to check against student work.</p>	<p>Phet Go to Math. Then you may choose either concepts or applications. Both have a variety of interactive simulations related to Number topics, Algebra, Probability and more.</p>	<p>Polyup Interactive activities that encourage computation thinking</p>



Kansas Association of Teachers
of Mathematics

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			<p>Robert Kaplinsky A wide variety of problem-solving lessons based on real life math scenarios.</p>	<p>New York Times Graph of the Day A different graph posted each day gives students opportunities to see statistics in the real world and analyze the message of a graph</p>	<p>Splat! Students are shown representations of numbers. A "splat" is put over part of the representation, so part of the representation is hidden. Students are asked how many are still shown and asked to reason through how many are hidden.</p>
			<p>Visual Patterns Pictorial patterns are presented. Learners examine how the patterns change, and articulate that growth multiple ways (including formulaically).</p>	<p>Vi Hart You Tube Channel These videos give a different and interesting perspective on how math shows up in the world. Her math doodle videos are fun!</p>	
			<p>Youcubed.org</p>	<p>Pixar in a Box Great resource</p>	



Kansas Association of Teachers
of Mathematics

			find a number of great tasks that are real-world. The site offers great other resources for all grade levels. Under News there are newsletters that give good information about math at home.	about all different aspects of animation from Pixar, both math related as well as other fields	
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