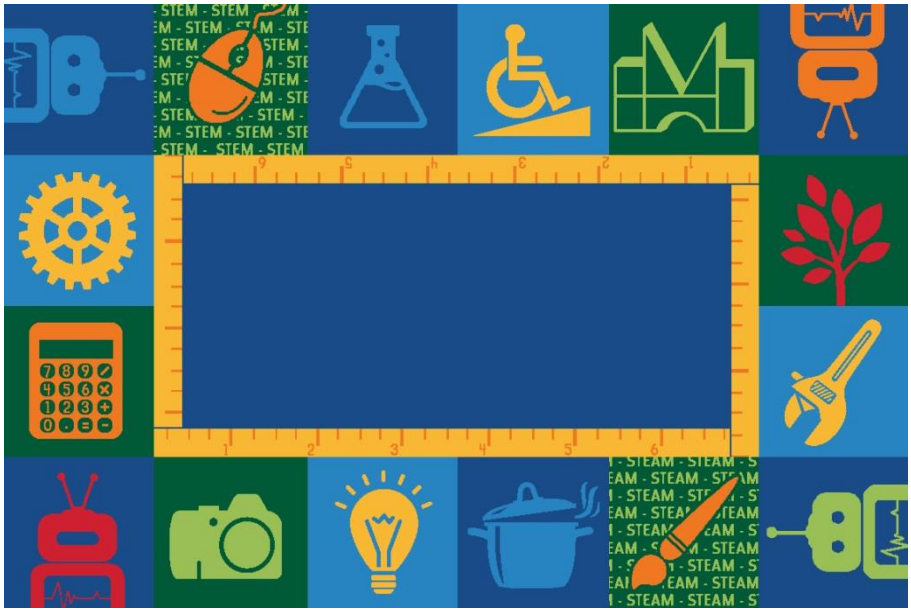
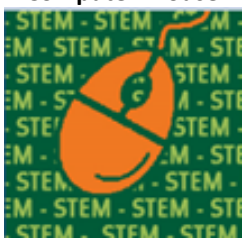
BECKER'S® STEM's Got STEAM Rug



This rug is more than a place to sit - it can set the stage for some great STEM and STEAM lessons! Let's start with an explanation of how each graphic image relates to Science, Technology, Engineering, Art, or Math.

Image	STEM/STEAM Discipline	Descriptions to help teachers explain each symbol	Related Activities for Students
Robot 	Science Technology Engineering	A robot can be a toy or a tool that is used to do jobs. Robot toys have lots of moving parts and sometimes make sounds and respond to directions. Real robots are used to help people do hard jobs. They can help build things, move heavy loads, do clean-up jobs, or other tasks that are hard for humans to do.	Name how the 4 robots on this rug are different. How are they the same? Make a classroom robot using various size boxes, cardboard tubes (from paper towels, wrapping paper), paper plates, cups, etc. Let the children problem solve how to connect the pieces. Make a robot puppet using a paper lunch bag or grocery bag, aluminum foil, pipe cleaner antennae and other craft materials. Let each child tell about one task their robot performs.
Computer Mouse 	Technology	A mouse is a tool used to make things happen on a computer screen. Tools are good examples of technology. When you use tools, you are using technology.	This device has the same name as an animal. What's the same and what's different between this and a real mouse? Set up a tool museum in your classroom by borrowing a wide variety of tools from families. Remember a tool can be as simple as a pencil. It serves a function. Learn the names of tools and their uses.

Flask 	Science Math	A flask is a container, similar to a bottle that is used to do science experiments. It's usually filled with liquids and sometimes combined with other liquids for testing.	Set up a Science Lab with 3 clear plastic cups (flasks), a measuring cup filled with water, and small bowls with sand, salt, and sugar. Put a mark at the half-way point on each cup. - Pour water into each cup up to the line. - Put one tablespoon of sand, salt, or sugar into each cup. Mix. - Does it dissolve? How can you tell?
Ramp 	Science Engineering	A ramp is an example a STEM concept because it was designed using science and engineering knowledge. A ramp is an inclined plane – a simple machine. It makes it easier to move something from a low height to a high height.	What is pictured on this ramp? How does a ramp help someone who uses a wheelchair? Set up a ramp in the block area and let children experiment with moving objects from low to high and high to low. - Do things move more easily when you change the incline of the ramp? - Experiment with racing cars down a ramp. What makes them go faster or further?
Blocks 	Math Engineering Science	Unit blocks can be used to teach size, quantity, shapes, and other math concepts. Children also learn science and engineering principles such as stability, balance, and design when building.	Set up Block Challenges: - Build something that looks just like the blocks shown on this carpet. How many blocks will you need? How many different shapes? - Line up 5 square blocks and 5 rectangle blocks end to end as if making a road. Which road is longer? - How many more blocks can you add to make them the same? - Now take those same blocks and stack them on their sides (not end to end). Which is higher?
Tree Branch 	Science Math	Children can learn about patterns, symmetry, and number concepts from natural materials. Go outdoors and explore! Leaves and seeds make great math counters and sorters.	- Plan a nature walk and follow-up activities using math and science skills. Ask the children to predict which of the things that are shown on this carpet will be seen on their outdoor walk. - Collect anything that comes from a tree (seeds, leaves, broken branches, bark). In the classroom, organize your materials for some scientific studies. Sort and classify by shape, color, texture, or size. Use measuring tools to make size comparisons. - On your next walk, plan to measure the circumference of a tree. Can you use a ruler for that measurement? What tool would work best?

Wrench 	Technology Science	A wrench is a type of tool that is designed to tighten or loosen nuts and bolts. Tools make some tasks easier. When you use a tool to perform a task, you are using technology.	Challenge children to look around the classroom and find things that are put together with screws, bolts, and nuts. Look really hard – under the tables and chairs, on classroom easels, sinks, etc. - What would happen if these screws got loose? How would you solve that problem? Do a job without a tool and do one with a tool. Which is easier? Here are some ways to demonstrate how tools can make jobs easier: - Can we vacuum the floor with our hands? What happens when we use a vacuum? - If you have a hammer pounding toy, try to pound in a peg with your hand; then use the hammer. - Invite a carpenter or handy parent to the classroom to demonstrate the use of a wrench and other commonly used tools.
Paintbrush 	Art Science Math	A paintbrush symbolizes art. There are many forms of art which can be used during STEAM activities. Clay can change from a moldable material to a hard material; paint spreads when wet, not when dry; glue can disappear when dry, etc. So when we are doing art activities, we can talk about science.	Try magnetic painting. Use magnet wands, light metal objects, paper, shallow plastic container, and paint. - Cut the paper to fit the bottom of the container. - Dip the metal objects in paint and place on the paper. - Hold up the container and use the magnetic wand underneath to move the objects around. - The magnetic wand will move the objects and create a painting! Art is also a great way to illustrate scientific observations and experiments. Children can make a book of drawings showing changes that take place during science activities.

Cooking Pot 	Science Math	Why is there a pot on a STEM Rug? A fair question with an easy answer. Cooking is one of the best activities for teaching STEM concepts. It involves mixing ingredients similar to how scientists mix solutions; predicting and observing changes; precise measurements; liquids vs. solids; and critical thinking. What could I do to make this batter smoother? Sweeter? Thicker?	Children can participate in the measuring, combining, mixing, and kneading part of this recipe. • 1 cup water • 1 tablespoon vegetable oil • 1/2 cup salt • 1 tablespoon cream of tartar • 1 cup flour Combine water, oil, salt, and cream of tartar in a saucepan and heat until warm. Remove from heat and add flour. Stir, and then knead until smooth. - Have children describe each ingredient in terms of a solid or a liquid. - After the dough cooks, can the children see the individual ingredients? - Where did the flour go? - What happened to the oil? - Try the same recipe without heating the ingredients. How does heat affect the results?
Light Bulb 	Science Technology Engineering Art Math	A light bulb is a symbol for an idea. When we provide materials for open-ended exploration, a safe learning environment, and an encouraging atmosphere for discovery, children will find ways to solve problems and answer questions with their own ideas. When scientists and engineers come upon a problem without a solution, they need to generate an idea. Ideas start here!	Create centers where children can use their own ideas to solve a challenge: - Make a boat out of aluminum foil that can carry 1 small block in a tub of water without sinking. - Build a house for the Three Little Pigs that won't fall down when the wolf huffs and puffs on it. Use pipe cleaners, craft sticks, and other found objects. - Build a bridge for cars over a pretend river. Build it high enough for a 12" high boat to pass underneath.
Camera 	Technology Science Engineering	A camera is used to take pictures or videos of people, places, or things. A camera is an effective tool to use for documenting changes in science experiments or to illustrate the steps in an engineering project.	Set up challenges in the block area. Tell the children that you're going to take pictures while they are building. And the most important pictures are the ones that show when something didn't go right. Those are the moments that you need to capture and learn from! Post the pictures in the block area and have the children give you the captions for each one.

Calculator 	Math Engineering	Children might recognize this tool even if they haven't had a chance to use one. Introduce the calculator as a tool that adds, subtracts, and multiplies numbers. It's used to help mathematicians, scientists, and engineers do their jobs.	Bring a calculator to the classroom. Show children how it works and teach them these vocabulary words: - Keyboard - Screen or Visual Display - Battery or Power Cord
Gears 	Science Engineering	Gears are simple machines. A gear is a wheel with teeth, sometimes called a cog. You need to connect at least 2 gears to see movement. Gears make work easier. If you turn a big gear slowly, it can make a small gear move quickly. The big gear is called the driver. We see gears everywhere. Start looking for gears in clocks, bikes, remote controlled cars, can openers, even on big amusement rides. If you can't see them, they're hidden inside.	You don't have to go far to find examples of gears in and around your classroom. You can find these and more at ShopBecker.com **Gear Building Toy**   **Sand and Water Wheel** Describe what happens when you turn one gear. What happens when you pour water in the top? Sand? What else could you use to make the gears move?
Ruler 	Science Engineering Math	There are many names for measuring tools. This could be a ruler, a tape measure, or a yard stick. These are called standard measuring tools. Sometimes we use non-standard measurement tools in school such as cubes, links, blocks, and other small objects. The ruler goes all around the inside perimeter of the rug because measurement is used across *all* the STEM disciplines!	The tool shown on this rug is typically used to measure the length or height of something. Children and grownups come in all different heights. Some are tall and some are short. No height is better than another. Measure each child's height and make a graph. Try these follow up activities: - Walk around the classroom and find someone who is taller than you; shorter; the same height. - Cut a string the same height as each child. Let children take their string around the class and find something that is shorter and something that is longer. In science and engineering we measure lots of things. - What do you use to measure weight? To measure time? - How would you measure the weight of a person? The weight of a truck?

After children are introduced to the symbols on this rug, try these STEM Rug Riddles. You can ask questions during transition times or when children are getting settled onto the rug. You can also try it as a whole group activity with children standing along the outside of the rug and stepping on the square with the correct answer.

STEM's Got STEAM Rug Riddles

1. I will not work alone. I always want to be connected to something else.
   What Am I?
2. Sometimes I make a clicking sound, sometimes I flash. I am used to document projects in the classroom.
   What Am I?
3. I light up a room and I can light up your mind with new ideas!
   What Am I?
4. I might look small but I can add up lots of big numbers!
   What Am I?
5. When you put vegetables inside me and add water, I make soup!
   What Am I?
6. The more you use me, the happier I will be. I like to be dipped in colors and used to make pictures.
   What Am I?
7. I am a tool that can help you tighten or loosen nuts and bolts. Remember rightie tightie, lefty loosie.
   What Am I?
8. You'll find me outside. Yesterday I was green, today I'm red, next week, I may turn brown.
   What Am I?
9. I'm made out of wood and have flat sides. I can be put together many different ways. I can be a house, a road, or a rocket ship!
   What Am I?
10. People like me because I make it easier to move heavy items up an incline.
    What Am I?
11. I like to pretend I'm a scientist and fill these with different liquids and see what changes.
    What Am I?
12. I'm named after a small animal with a long tail that likes to eat cheese. I get along great with my computer.
    What Am I?
13. I like to help people do jobs. Sometimes I make funny sounds when I'm moving.
    What Am I?

Answer Key: 1)Gear 2)Camera 3)Light Bulb 4)Calculator 5)Cooking Pot 6)Paintbrush 7)Wrench 8)Tree Branch 9)Blocks 10)Ramp 11)Flask 12)Computer Mouse 13)Robot