

Picture This:

STEAM

for Young Readers

CLASSROOM KIT

INCLUDES

discussion questions,
extension activities,
and curriculum tips

Using **STEAM** Picture Books with Young Readers



In today's world, change is constant. Innovations in the areas of Science, Technology, Engineering, the Arts, and Mathematics (STEAM) are evolving at lightning-fast speeds. How will our children meet today's challenges?

For many years, education has focused on teaching facts and figures through repetition and memorization. While this approach still has a place in classrooms, we must now focus on teaching skills and processes that enable children to think, create, and innovate. Today's children must be collaborators, communicators, problem-solvers, and creative thinkers. They should be encouraged to ask questions, make predictions, try multiple solutions, and learn from the process as they explore and experiment.

Fortunately, more and more picture books encourage children to wonder, explore, and create. The titles listed below each provide children with an opportunity to learn and discuss. These books help prepare our children to approach the fast-paced, ever-changing world with excitement and optimism, questions and ideas, and suggestions and solutions.

Presenting STEAM activities to children should involve an interdisciplinary approach, as many of these curriculum areas overlap. Children must be given the opportunity to experiment using hands-on materials and activities. New technologies and learning tools should be available to children so they can explore and try to solve problems in different ways. Children should be encouraged to work in pairs or small groups to develop collaboration and communication skills.

STEAM books can inspire children and trigger their curiosity and wonder. After presenting children with a STEAM picture book, begin by

asking questions. What is surprising? What is challenging? How might you meet these challenges?

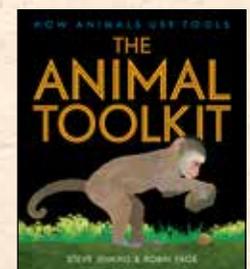
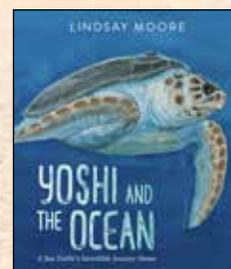
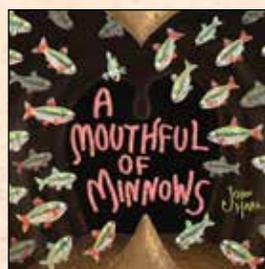
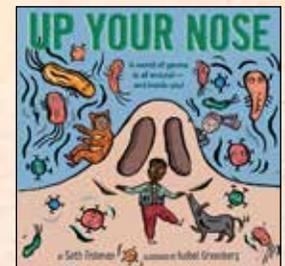
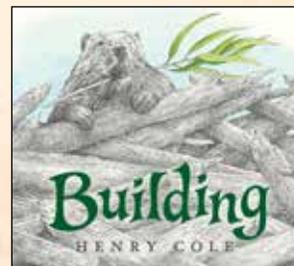
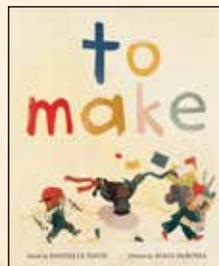
What do you want to know? How can you discover and learn? Children might suggest doing research, exploring outdoors, trying an experiment, taking a field trip, or talking to experts. Providing these opportunities is critical for children to grow and learn.

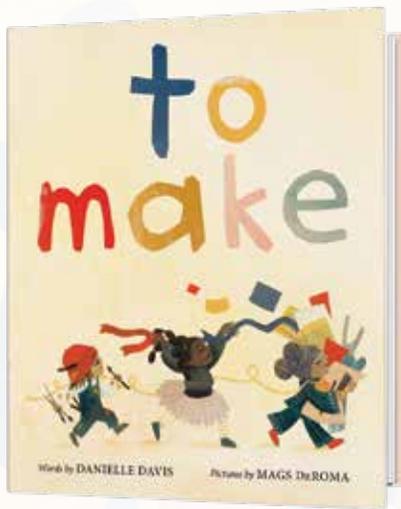
An easy way to encourage STEAM activities is to keep a variety of materials and tools nearby for children to use. They can include paper, art supplies, books, and building materials. There are countless items that children can use to create, such as fabric scraps, marbles, paper clips, balloons, magnets, food coloring, cardboard, paper towel rolls, Legos, buttons, seeds and soil, clay, and popsicle sticks. Children can explore using tools like a calculator, a ruler, a microscope, or a balance scale. The list is endless!

STEAM books should inspire children to learn, grow, and share with each other. If children make a discovery, their findings should be shared with their peers. Learning is especially fun when children teach each other and exchange ideas. This benefits children in a multitude of ways. When children share their learning, they expand their peers' knowledge base while also building their own self-esteem. This encourages children to take risks and to keep exploring on their own, which is how all creators and innovators are born. It is important to acknowledge all children's ideas, even if they seem implausible. Many of our most successful innovators have made what seems impossible come to life!

The following books present **STEAM** opportunities for children to learn, think, and explore:

- ***To Make*** Written by Danielle Davis and illustrated by Mags DeRoma
- ***Building*** Written and illustrated by Henry Cole
- ***Up Your Nose*** Written by Seth Fishman and illustrated by Isabel Greenberg
- ***A Mouthful of Minnows*** Written and illustrated by John Hare
- ***Yoshi and the Ocean*** Written and illustrated by Lindsay Moore
- ***The Animal Toolkit*** Written and illustrated by Steve Jenkins and Robin Page





to make

By Danielle Davis, Illustrated by Mags DeRoma

ABOUT THE BOOK

The author, Danielle Davis, has the following advice for makers and creators of all ages: “Gather, make, and wait.” Whether you are making a cake or choreographing a dance, planting a garden or writing a song, these simple steps will guide you to create something unique that only you can make. Sometimes you will need to make and remake, or wait and wait, but don’t give up! The author’s message about creativity, perseverance, and innovation is beautifully conveyed through rhythmic, sparse text and vibrant illustrations.

DISCUSSION QUESTIONS

- Show the children the end pages. What could you make with some of these items?
- Then show them the title page. What do you think is inside those doors?
- Read the first few pages. Have you ever helped someone bake? How did you do it? What did you make?
- If you planted a garden, what would you want to grow? Why?
- What does the child use to write a song?
- What do you need to create a story?
- How does the child make a friend in this book?
- Why does the author say that sometimes you will “wait and wait”?
- Why is it important to keep making and creating?



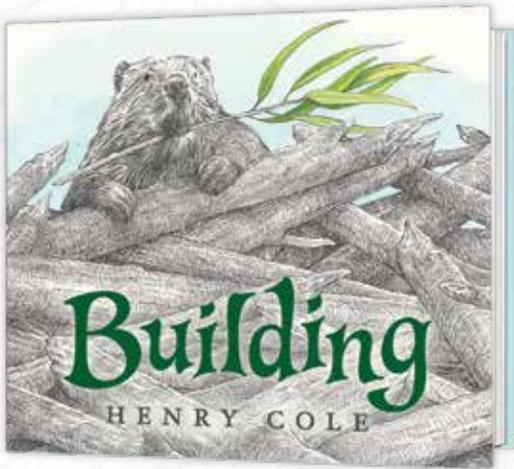
EXTENSION ACTIVITIES

CALLING ALL CREATORS! Start a Creators Club. Ask the children what they might like to build, draw, make, or create. Gather materials and have everyone contribute items. You can refer to the opening endpapers of this book and have the children discuss what they see. Prepare a space for the Creators Club members to work, build, and create. Engage the children in helping to design the workspace. Then have them start creating!

HOW DOES YOUR GARDEN GROW? Reread the garden pages from the book: “To make a garden, gather, make, wait.” Discuss the different types of gardens (e.g., flower, herb, vegetable) and ask the children what kind of plants they would like to grow. Will they plant indoors or outdoors? What materials will they need? Start to gather the materials, make the garden by planting the seeds, and then wait and observe its growth. Remind them of the author’s words: “Sometimes you will... wait and wait what feels like forever.” Have the children record weekly observations as they wait and watch how their garden grows.

WHAT’S COOKING? In this book the child bakes a cake. Ask the children what foods they know how to make and have them write a simple “recipe” to share with the class. Some will know how to make eggs or pasta or a family dish, while others might want to describe how to make a sandwich or prepare a bowl of cereal. Model how to use the sequential words “first,” “next,” “then,” and “last” when writing a how-to piece. You can have the children illustrate their “recipes” as well and then collate the pieces into a group cookbook!

LET’S WRITE! Ask the children to recall some of the things that were made in this book. Tell them that you are choosing to focus on these three: a story, a poem, or a song. Have the children decide which they would like to create, and have them work in pairs, in small groups, or as a whole group. Remind the children that writing is a process, and as the author suggested, you must gather ideas, write, wait, and rewrite. Encourage communication and collaboration. When the pieces are finished, have the children share their work with the rest of the group.



Building

By Henry Cole

ABOUT THE BOOK

Beavers are clever animals and hard workers too! This book describes how two beavers search for a place to make their home. Then they use their strong teeth and jaws to cut down trees, haul them into a stream, and build a dam and a dome-shaped lodge. There they can safely start a family. Readers will marvel at the ingenuity of these animals and appreciate how beavers care for their young just as the children's own families care for them.



DISCUSSION QUESTIONS

- Read the first page. What kind of place do you think the beavers are searching for? Why?
- Why is it important that willow and maple trees are nearby?
- What do beavers use their strong teeth and jaws for? How are they able to cut the trees down?
- What is a dam?
- What happens when the dam holds the water back?
- What do the beavers build in the middle of the pond? How do they get inside it? Why do they build the lodge?
- What do the adult beavers do when a coyote comes?
- What happens to the beavers' home after a storm?
- What other animals come to live by the pond?
- How do the beavers prepare for the winter?
- Read the author's note to the children. Why are beavers "outstanding and important engineers"?

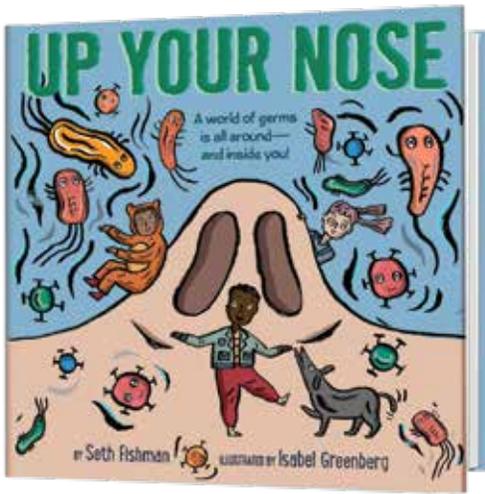
EXTENSION ACTIVITIES

DREAM ON. Beavers know how to design and build their home. Ask the children to imagine how they would design and build their own dream home. What would it look like? What special features would it have? Give the children a large piece of paper and have them create a "blueprint" of their dream home. Encourage them to have fun with this activity and to think creatively. Will their dream home have a bowling alley? A secret hallway? A slide to go downstairs? Have the children draw a detailed picture and label their design. Then have them share their work with the rest of the group.

HOME SWEET HOME. In this book, the children learn how beavers make their home. But do other animals also build their homes? Provide the children with resources (e.g., books, Internet sources, or online learning tools such as Capstone's "Pebble Go") to explore where other animals live and if and how they build their own home. Weaver birds, termites, and bees are just a few examples of home-building animals to research.

I'M WARNING YOU! Beavers slap their tails on the surface of the water to warn others that a predator is nearby. Challenge the children to learn how other animals warn each other of danger. For example, jackrabbits thump the ground when they sense danger. What do other animals do? Research this topic together and create a list of animals that warn each other when danger is nearby and how they do it. Have the children choose one of these animals to illustrate and collate the drawings into a group book.

BUILD IT UP! Discuss how and why beavers are amazing builders. They cut down trees into smaller pieces and use mud to hold them together. Then challenge the children to build a lodge like beavers do. Give pairs or small groups of children a building material (e.g., twigs, toothpicks, straws, or craft sticks). Ask the children to decide how they will use their material to build the lodge, and how they will hold their pieces together. Have the children take a "Museum Walk" to view each other's lodges. What worked well? What would they change next time?



UP YOUR NOSE

By Seth Fishman, Illustrated by Isabel Greenberg

ABOUT THE BOOK

This entertaining and informative book provides readers with a solid understanding of what germs are, where they are found, the different types of germs, and why they live in our bodies. Readers will learn how germs affect us and what we can do to stay healthy. After reading and discussing this book, children should be inspired to develop lifelong healthy habits.

DISCUSSION QUESTIONS

- Read the first four pages and ask the author's question: "Why are there so many rules?"
- Why can't we see germs?
- Are germs inside and outside your body?
- Are all germs the same?
What are the different types of germs?
- Where would you find germs in your home?
- What is the easiest way to get rid of germs?
- What happens if certain germs get inside your body?
- What are some ways your body helps to defend itself against germs?
- How can doctors and scientists help us?
- How can you help yourself stay healthy?
- Are some germs good for you?

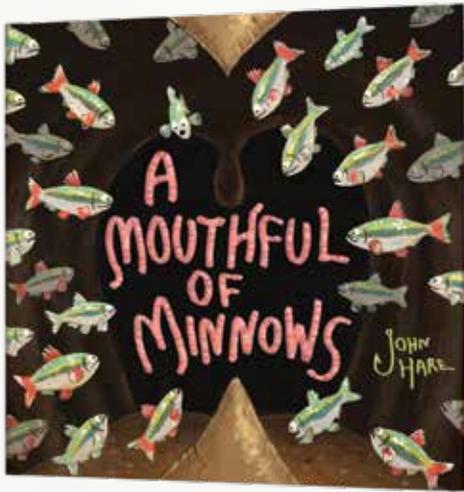
EXTENSION ACTIVITIES

HEALTHY HABITS. Make a chart of healthy habits with the children, including both the author's suggestions in this book (e.g., wash hands, eat healthy, sleep well, exercise) and the children's own ideas. Then give each child a piece of thick paper or tagboard. Have the children draw a line horizontally across the page and then vertically to create four boxes. In each box, have the children write a healthy habit and illustrate it. The children should then cut the paper on the lines to create four puzzle pieces. Clip the pieces together and then have children exchange puzzles to complete each other's puzzles.

WASH UP! Germs are microscopic, but these experiments concretely demonstrate how germs are transmitted, how proper handwashing protects us from germs, and why it is important to use soap when washing hands. [This video](#) illustrates these concepts using glitter and baby oil. [This video](#) shows soap and pepper being used to demonstrate how soap combats germs. You can show the videos to the children and then do the experiments with them.

GET SOAPY! If you want to encourage children to use soap when washing their hands, have them make their own soap! There are many videos and do-it-yourself methods or recipes for soapmaking with kids. Try this one from PBS Kids: <https://www.pbs.org/parents/crafts-and-experiments/how-to-make-soap>

SCOPE IT OUT. Discuss why we cannot see germs on our body. Ask the children how scientists study germs and other tiny living things. What tools do they use? If possible, bring in a microscope for children to use and explore. The children can gather materials, such as leaves and feathers, to observe under the microscope. This video <https://www.youtube.com/watch?v=MxSSqDOcuQc> shows how some natural objects look under a microscope and encourages the children to guess what they are.



A MOUTHFUL OF MINNOWS

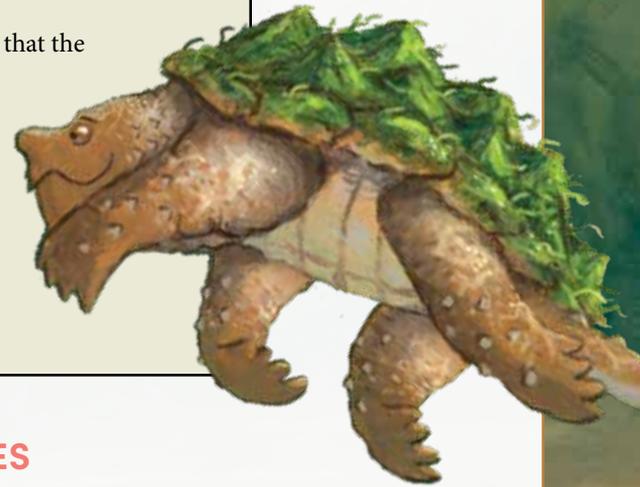
By John Hare

ABOUT THE BOOK

Alphonso, an alligator snapping turtle, is hungry and ready to fish for breakfast. His wormlike tongue quickly attracts some fish, but when Alphonso realizes he is about to eat a whole fish family, his conscience gets the better of him and he lets his meal swim away. Then when the fish family confronts danger, Alphonso saves the day! While he doesn't end up with a meal, he does have a great fish story to tell his friends.

DISCUSSION QUESTIONS

- What does Alphonso like to eat?
- What is special about Alphonso's tongue?
- Why do the minnows keep waiting to eat the "worm"?
- Why does Alphonso decide not to eat the minnows?
- What does Alphonso do to save Big Betty and her family?
- Where did the worms that the minnows were eating come from?
- How does Alphonso feel about not catching anything for breakfast?
- Why does Alphonso feel this way?



EXTENSION ACTIVITIES

SAME AND DIFFERENT. Read the author's note at the end of the story. Compare and contrast the two types of snapping turtles. Record how they are alike and different using a Venn diagram, a two-column list, or a chart. Then think about other pairs of animals that are similar but also different. (For example, a jaguar and a leopard, or a frog and a toad). Have the children create a chart or poster showing how the two animals are the same and how they differ.

HOW DO THEY EAT? Discuss how an alligator snapping turtle catches its prey. Then have the children think about how other animals catch their food. Ask the children to choose an animal to research, and then have them write and illustrate how their animal finds food. Have the children present their findings to the rest of the group.

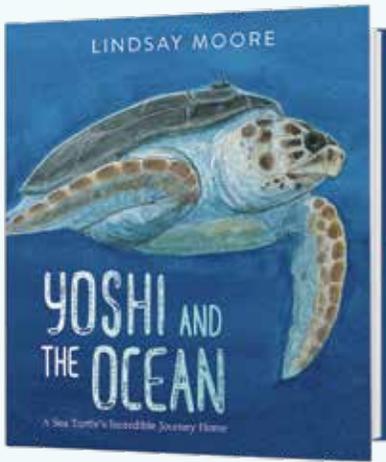
LET'S GO FISHING. Have the children draw and cut out paper fish or give them a template of fish to cut out. Then have them create a fishing game using these paper fish. First, choose a focus for the game, such as diagrams, sight words, addition, or subtraction. Next, have the children write words

with diagrams on the fish, or sight words, or math equations. Then, tell the children how to play the game: first they must read the word or solve the equation, and if successful, they can "catch" that fish. The game ends when all the fish are "caught." Challenge the children to design a method to catch their fish, such as using a magnet and paper clips, or flattening some playdough on the end of a craft stick and lifting the fish with it.

HIDE AND SEEK. Ask the children if they can spot the blue lobster which is on almost every page of this story. Then have the children create their own hidden animal picture. First, they should choose a habitat (e.g., the ocean, the rainforest, the desert) and draw that habitat. Then they should list 6-8 animals that live in this habitat. Finally, they should draw the animals on their habitat picture, but try to draw them in a way that they are somewhat hidden. When their pictures are done, have the children switch with partners so that they can find each other's hidden animals.



Art © 2022 by John Hare



YOSHI AND THE OCEAN

By Lindsay Moore

ABOUT THE BOOK

This inspiring book tells the true story of Yoshi, an injured sea turtle that is rescued and brought to an aquarium in Cape Town, South Africa. The staff care for her and help her to grow strong and healthy. After many years, when it is time to release her back to the wild, Yoshi begins the long, dangerous journey home thousands of miles away. Will she survive the dangers of traversing the deep, wide ocean?

DISCUSSION QUESTIONS

- Who finds Yoshi? Where do they bring her?
- What do the people who care for her at the aquarium realize?
- Why are they worried about releasing her?
- How do they prepare Yoshi for her journey home?
- How do the scientists keep track of her location?
- What does Yoshi eat on her journey?
- What direction does Yoshi swim? Where might she be heading?
- How long is Yoshi's journey home?
- Where is her home?
- What dangers has she overcome?

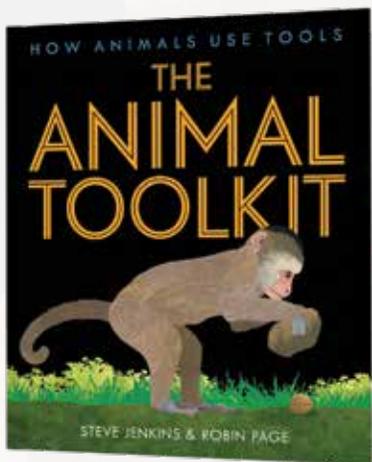
EXTENSION ACTIVITIES

INSIDE AND OUT. The author includes a fascinating diagram of a sea turtle's body that illustrates the sea turtle's external and internal anatomy. Ask the children to choose a sea animal and provide them with resources (e.g., books, websites, publications) to create a diagram of their animal's anatomy. Discuss if the children should focus on both the external and internal features of the animal's anatomy or just one aspect.

DANGER! DANGER! Discuss the dangers that humans have inadvertently created for sea turtles (and other ocean animals). Visit the websites included at the end of this book to learn more about sea turtles and how we can help them. Have the children create posters and display them to educate others. Older children can write an informational report or prepare an oral report on this topic to share with the group.

WHAT A LIFE! The author provides information about a loggerhead sea turtle's life cycle. Ask the children how long they think a sea turtle can live and discuss its lifespan. Then ask: How long do you think other sea creatures live? Do they live longer than humans? Research this topic with the children and develop a chart representing the lifespan of various sea creatures. Include a variety of animals to demonstrate the wide range of lifespans. (For example, a pygmy goby fish lives about 59 days, sea otters live 15-20 years, and the bowhead whale can live 200 years!)

MAP IT OUT. Yoshi passes three continents on her 25,000-mile journey. Show the children a world map and discuss the seven continents and the five major oceans of the world. Then give the children a template to make their own world map. With direction from the book, have the children trace Yoshi's journey on their own map.



THE ANIMAL TOOLKIT:

HOW ANIMALS USE TOOLS

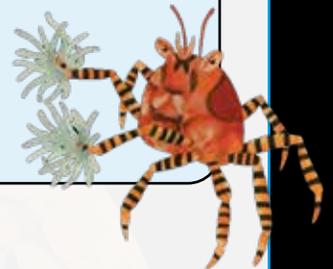
By Steve Jenkins & Robin Page

ABOUT THE BOOK

Animals are amazing! Readers will learn how intelligent animals use various tools in nature to protect, feed, defend, and comfort themselves or their young. Did you know that a bird can sew a leaf to make a nest? Or that a dolphin uses a shell to catch fish? Filled with remarkable facts along with humorous captions, this book will enthrall readers and animal lovers of all ages.

DISCUSSION QUESTIONS

- Read the introduction. Ask the children if they can guess what animals might be discussed in this book. What tools do you think they might use?
- Have you ever observed an animal use a tool? If so, describe what you saw.
- Read the pages “Eat, drink, fight,” “Don’t forget to floss,” and “Pound it.” What is the same about these animals? How are they like humans?
- Read the pages “Baby’s first meal” and “A trap of silk and stone.” How do these animals use tools to catch food?
- What can an octopus do with coconut halves?
- How are leaves used as tools by animals?
- How do birds use sticks as tools?
- What do fire raptors, such as the black kite, do with burning branches?
- How are rocks used as tools by animals?
- How do bottlenose dolphins use tools to get food?
- What surprised you in this book? Do you think differently about animals after reading it?



EXTENSION ACTIVITIES

THE TOOLS OF THE TRADE. Ask the children to think of a problem that needs to be solved. What tools could help to solve it? Children can choose a problem that is relevant to them and it can be as simple as how to get peanut butter out of an almost-empty jar. Have the children draw and describe how they would use a tool(s) that already exists, or how they would design a new tool to solve the problem. Then, if possible, provide the children with materials to build their tool.

IN THE FIELD. This book will inspire and excite children to go out in the field to observe animals using tools. Take a nature walk outside to observe the behaviors of local animals or take a field trip to the zoo, an aquarium, or a nature preserve. Bring along binoculars, cameras, and sketchpads so children can observe and document the animal behaviors.

A WHOLE LOT MORE. This book is filled with fascinating animal facts. The authors include additional information

about each animal at the end of the book, but the children can learn much more if given the opportunity to research and present their findings to each other. Older children can choose an animal to research independently, while younger children can work with an adult or together in a large group. Children should have access to books, websites, virtual field trips, and other publications (e.g., *Ranger Rick* or *National Geographic Kids*) to find information. Depending on the age of the children, they can create a detailed report, a poster, a booklet, or an oral presentation to share their data.

TOOL AROUND. Present the children with a collection of materials such as twigs, paper clips, rubber bands, shells, pipe cleaners, straws, marbles, and popsicle sticks. Ask the children to brainstorm ways to use these items as tools. What could be accomplished using these tools? Encourage divergent and creative thinking. Have the children present their ideas to the group, as this will likely trigger more discussion and creativity.

