

Super Sleuths

Science for 3–5 year-olds



We gratefully acknowledge the financial support of the Province of British Columbia through the Ministry of Education.

CAREGIVERS, PARENTS AND PRESCHOOL EDUCATORS provide many creative opportunities for young children to explore their world. That's why we've created *Big Science for Little Hands*, an evolving suite of science resources for teachers and caregivers of 3–5-year-old children. Our aim is to develop activities that inspire further exploration and discovery. We hope that these resource materials complement what you are already doing and offer additional ideas to inspire further exploration.

The activities have been designed for experiential learning. The intent is for children to experience each concept, rather than simply talking about it. Each activity can serve as a starting point for further exploration.

The activities are divided into the following categories.

Introductions—These could be used to set the stage for the topic, or to find out how much the children already know. They're low-preparation, low-mess activities for a large group to do together.

Explorations—These require a bit more set-up and clean-up. They work best with small groups of children. They're intended to be open-ended, with a teacher or other adult available to pose questions and expand the activity as required.

Make This—These explorations result in a product that children can take home or display.

All Together—This big whole-group activity would make a great wrap-up to the topic.

Connections—Ideas for extending the topic in cross-curricular ways.

You know your group best! There is no perfect way to order or arrange these activities. They could be combined into a whole day on a theme, or taken one at a time over several weeks. Please pick and choose, expand or contract as makes sense for your group of children.



Check for more resource packages coming soon:
scienceworld.ca/preschool.html

September 2009

Science World British Columbia
TELUS World of Science 1455 Quebec Street, Vancouver, BC Canada V6A 3Z7
t 604-443-7440 f 604-443-7430 w telusworldofscience.com/vancouver

Topics Now Available:

Round the Circle

Activities to explore round things and things that roll.

Wet & Dry

Activities to explore being wet and dry.

Sticky Stuff

Activities to explore stuff that sticks.

Size Matters

Activities to explore things that get bigger and things that get smaller.

Mysterious Mixtures

Activities to explore dissolving, separating, mixing and combining.

Super Sleuths

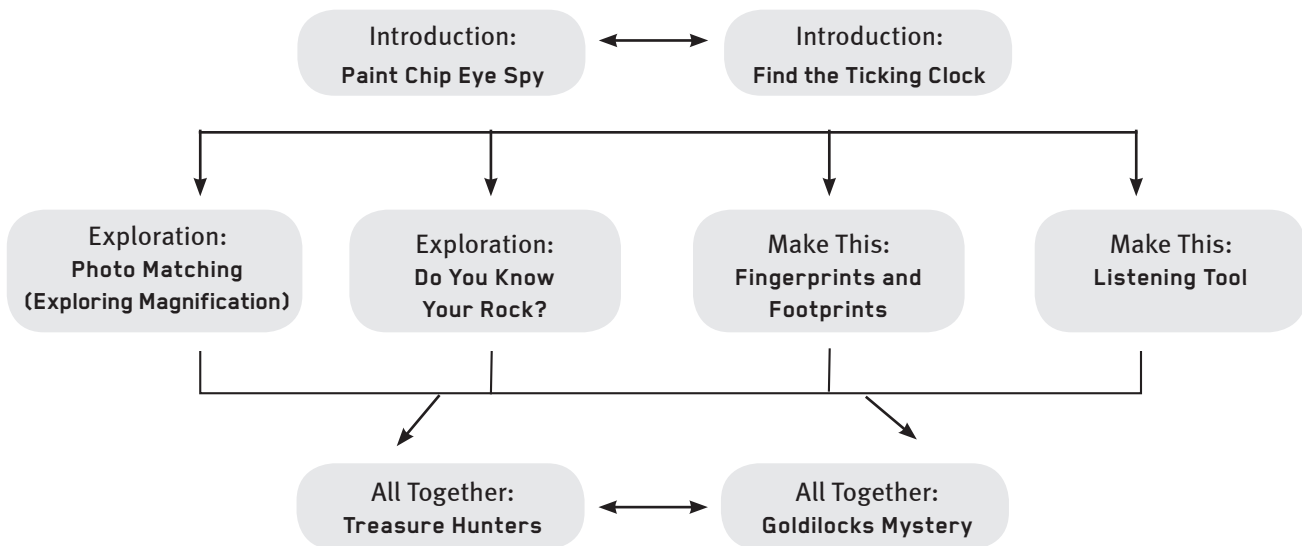
Activities to practice science process skills such as observing, comparing and contrasting and using tools like magnifiers.

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A Path Through *Super Sleuths*

Here's one possible way to put the activities in this resource together.

- Do one or two *Introductions* at circle time in a large group.
- Have the children try the *Explorations* and *Make This* in smaller groups at stations around the room.
- Try *All Together* just before the end of the school day, or at the end of a few days on the topic.



Big Science for Little Hands supports the learning goals outlined in the British Columbia Early Learning Framework, particularly those in the area of Exploration and Creativity.

To promote exploration and creativity, adults provide an environment where young children can do the following:

- explore the world using their bodies and all their senses
- build, create and design using different materials and techniques
- actively explore, think and reason
- identify and try possible solutions to problems in meaningful contexts and situations
- be creative and expressive in various ways
- develop a sense of wonder for natural environments
- express a zest for living and learning

(BC Early Learning Framework: bcded.gov.bc.ca/early_learning/)

Share with us!

Please send us your feedback, suggestions and ideas.

Email bslh@scienceworld.ca

Or visit scienceworld.ca/preschool.html and fill in an online survey.

Thank you to the children and families around British Columbia who assisted with the testing of the activities in this package. Thank you to The Canadian Children's Book Centre who recommended many wonderful children's stories.

Super Sleuths: Introductions



Paint Chip Eye Spy

Scientists and detectives need to carefully observe, compare and contrast. Practice your skills with this quick play-anywhere game.

What you need

- A selection of different coloured paint chips (from a hardware store)
- A space with lots of “stuff”

Hands-on

1. Choose a paint chip from the pile.
2. Find something in the room that matches that colour.
3. Choose again. Keep going for as long as the game is fun.

Questions to ask

What colour is this?

Can you see this colour somewhere in the room? Is it an exact match?

What else is similar in colour?

What next?

Take your paint chips to the park or on a nature walk to draw attention to colours in the environment. You can make colour matching easier by choosing colours that are obvious in nature (greens and browns), or harder by choosing colours that are less obvious (turquoise). Encourage children to look for subtle colour differences by selecting many different shades of the same colour.

Try out the *I Spy* book series.

Play the traditional form of *I Spy*: “I spy with my little eye something that is...”.

Notes for next time

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Where to next?

INTRODUCTIONS

- ▶ *Paint Chip Eye Spy*
- Find the Ticking Clock

EXPLORATIONS

- Photo Matching (Exploring Magnification)
- Do You Know Your Rock?

MAKE THIS

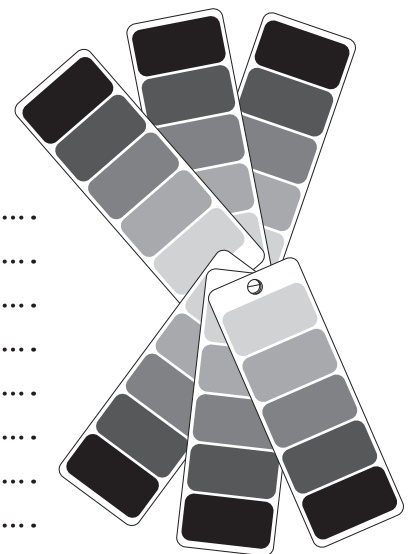
- Fingerprints and Footprints
- Listening Tool

ALL TOGETHER

- Treasure Hunters
- Goldilocks Mystery

CONNECTIONS

- More Ideas



Find the Ticking Clock

Observing can involve your sense of hearing as well as your sense of sight. Your ears are quite sensitive—but not as good as those of some animals. Practice your listening skills by hiding a noisy object and then trying to find it.

What you need

- Noisy object: timer that ticks or beeps, toy that plays a song, etc
- A quiet space with lots of hiding spots

Hands-on

1. Listen to the sound your object makes before it's hidden. You'll need to know what to listen for.
2. Sit quietly and listen to other sounds in the room.
3. Have everyone except the hider close their eyes. The hider should put the object out of sight, but somewhere where the sound can still be heard.
4. Hunt for the object together using your sense of hearing.
5. Repeat as many times as is fun.

Questions to ask

What sense are we using to find our object?
How can we make this game easier or harder?
What other sounds did you hear in the room?

What next?

Experiment with finding other noisy objects.
Have some listening time outside and talk about what you hear.
Listen to recordings of some household sounds and try to identify them (ringing phone, barking dog, etc.).

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More Ideas



Photo Matching (Exploring Magnification)

A magnifying glass is a tool used by scientists. When we look through its curved lens, things look larger and we can see detail we might not be able to with just our eyes.

By using zoomed-in photographs of objects, we can mimic the effect of a magnifying glass and explore looking at things from a different perspective. A camera has a curved lens like a magnifying glass does.

What you need

- Common objects
- A digital camera and photo printer
- Magnifying glass

Hands-on

1. Collect 6–10 objects that a child would recognize. A few of the things should have interesting texture or fine detail.
2. Take a normal scale photograph of each object, then a zoomed-in photograph (up close, showing detail) of each object.
Hint: use the macro function on your camera for good photographs.
3. Present the children with the objects and the regular photographs. Have them match the object with each picture.
4. Next, introduce the zoomed-in photographs with the objects. Try matching them again.
5. Use the magnifying glass to look at the objects close up.
Hint: to properly use a magnifying glass, hold it close to the object, not close to your eye.
6. Use the magnifying glass to explore more objects in the room or outdoors.

Questions to ask

- Can you match these items to their pictures?
- How did you know that these two went together? What was your clue?
- What do you see with the magnifying glass?
- What other things would you like to look at up close?

What next?

Explore your home, classroom and backyard with a magnifying glass to notice lots of details you wouldn't see otherwise. Try looking at pictures in a newspaper, cloth, your own skin, objects in nature.

Have children draw what they see with and without the magnifying glass.

Let children take pictures with a digital camera and experiment with the zoom feature.

Check out *National Geographic Little Kids* magazine or website for their zoomed in photos of everyday objects.

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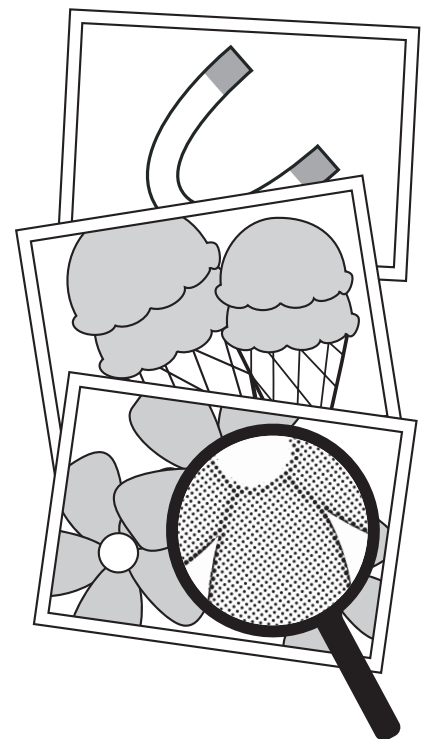
- Fingerprints and Footprints
- Listening Tool

ALL TOGETHER

- Treasure Hunters
- Goldilocks Mystery

CONNECTIONS

- More Ideas



Do You Know Your Rock?

Use your sense of touch and the sensitivity of your fingers to observe the unique details of a rock.

What you need

- Rocks (golf ball-sized works well)
- *Hint:* potatoes also work well
- Bag or basket

Hands-on

1. With your eyes closed, spend a few moments carefully feeling the surface of your rock and observing all the details of its texture.
Hint: If it's hard to keep your eyes closed, hold the rock behind your back.
2. Put your rock in a bag or basket with two-three other rocks and mix them up.
3. See if you can find your rock by touch alone.

Questions to ask

What is special about your rock? Is it rough, smooth, lumpy?
Can you figure out which of these rocks was yours? How do you know?

What next?

For a greater challenge, use more rocks or choose rocks that are more alike. To make it easier, choose very different rocks.
Try this activity with potatoes or lemons instead of rocks.
Go outside and hug a tree. Come back later and see if you can find the same tree by touch along (don't use your eyes).

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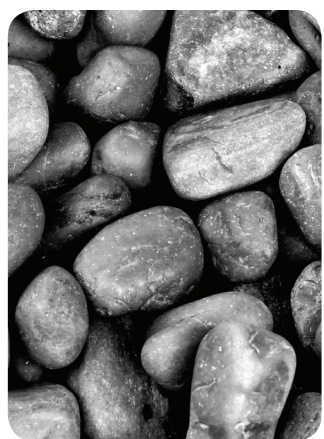
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Super Sleuths: Make This



Fingerprints and Footprints

Everyone has a unique pattern of lines on their fingertips called fingerprints. The lines are important for helping you grip things with your fingers. Everything you touch will have an imprint of your finger left from the oils in your skin. No two fingers are exactly the same. Scientists, detectives and police use copies of people's fingerprints to help identify them.

People and animals have different shaped feet. You might notice human footprints and animal tracks when you are out for a walk.

What you need

- Washable ink pads
- Magnifying glass
- Shallow bucket or pan with water or diluted paint
- Paper
- Large paper (butcher paper roll)

Hands-on

1. Make sure your fingers are clean.
2. Touch your fingers to the ink pad and then gently to the paper.
3. Use the magnifying glass to look at your fingerprints close up.
4. Take off your shoes and socks.
5. Step carefully into water or diluted paint and walk across a large piece of paper.
6. Take a look at the trail of footprints you left behind.

Questions to ask

What do you notice about your fingerprints? Do different fingers have the same pattern?
How are your fingerprints different from your friend's?
What do they look like up close?
How many footprints did you leave? Do they change? How are your two feet the same?
How are they different?
Are your feet the same size and shape as your friend's? What else do you notice about them?

What next?

Use your fingerprints to make art: turn them in to bugs, flowers and people. See kids.nationalgeographic.com/Activities/Crafts/Fingerprint-art for a sample.

Make an assortment of shoe prints in play dough or water. Can you tell which shoe left which footprint?

Tell a story by walking toy animals or dolls through paint and across paper. Can someone else figure out what happened by looking at the tracks?

Roll toy cars through water or paint to leave tire tracks.

Go for a walk and see what kind of animal tracks you can find in the snow, on the sand or in mud. Use an animal tracking book from your local library to figure out what kind of animal might have visited here.

Use animal track stamps from a craft store or science supplier like Ward's (wardsci.com) to explore the footprints of different kinds of animals.

Try finding "hidden" fingerprints on objects.

For instructions, visit scienceworld.ca/pdf/TTH/InvisibleFingerPrints.pdf.

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EXPLORATIONS

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- (Exploring Magnification)
- Do You Know Your Rock?

MAKE THIS

- *Fingerprints and Footprints*
- Listening Tool

ALL TOGETHER

- Treasure Hunters
- Goldilocks Mystery

CONNECTIONS

- More Ideas



Super Sleuths:

Make This



Listening Tool

A focused listening tool, like a stethoscope, helps us notice sounds we might not notice otherwise. The funnel collects the sound and the tube channels it straight to your ear.

What you need

- Garden hose or other flexible tubing
- Plastic funnel
- Duct tape

Hands on

1. Cut a piece of tubing about 50 cm long.
2. Insert the funnel into one end and secure it with duct tape.
3. Hold the tube end to one ear, and the funnel to different objects to listen to the sounds they make.

Hint: : Try listening to running, splashing and dripping water. Zippers, Velcro and items with different textures also make interesting sounds.

Questions to ask

- What kinds of things should we listen to?
- What does it sound like?
- Does this tool remind you of anything?
- Can you hear your own heart?

What next?

Using a real stethoscope, try listening to all sorts of things—machines as well as people.

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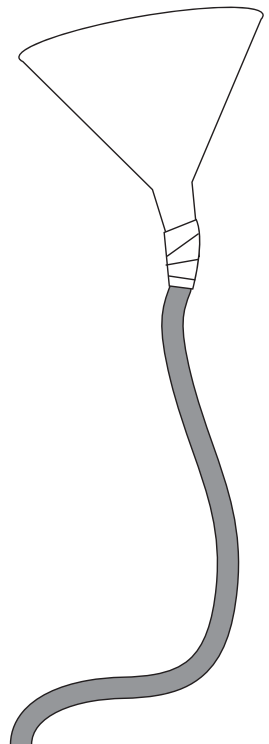
- Fingerprints and Footprints
- *Listening Tool*

ALL TOGETHER

- Treasure Hunters
- Goldilocks Mystery

CONNECTIONS

- More Ideas



Super Sleuths: All Together



Treasure Hunters

Part of being a good scientist or detective is to decode messages and follow clues.

What you need

- Treasure (puzzle or game pieces, photographs, etc.)
Note: find a puzzle template you can use at the end of this package.
- Clues

Hands-on

1. Plan your treasure and clues ahead of time. The treasure could be several pieces of a puzzle, ingredients for a snack, game pieces or a message about a special activity. Decide where you will hide the treasure and create your clues to help the children find the treasure.
2. Hide the treasure.
3. Explain to the children that treasure has been hidden around the room and that they need to find it. There are some clues to help them know where to look.
4. Take turns looking for each piece of treasure and bringing it back to a central location.
5. Once all the treasure is found, put the pieces together to reveal a message or picture.

Questions to ask

Where would be good places to hide treasure? Where would you hide something in this room? What hint do you think this clue is giving us? Where should we look to find the treasure?

What next?

Create a treasure map together of where all the treasure was located.

Alter the way clues are given: include pictures of where the clues are hidden or don't hide the treasures too deeply, but use colours, numbers or letters as clues.

Hint:

Here are some suggestions for Treasure Hunt Clues:

Block Area

Cities, towers and roads, here you might make; A clue hides there, don't be too late!

Dramatic Play

Here in the kitchen we all like to cook; Don't forget to take a really good look

Water or Sand Table

This spot is where you do lots of sifting and pouring; There hides a clue that will not be boring

Art

Here we draw, cut and glue to make beautiful art; Look very closely and be really smart

Games/Math Area

Count all the pieces to make sure they're all there; Puzzles and games are a fun place to share

Library/Books

The shelves are filled with stories and fables; Could that be something under a table?

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- Paint Chip Eye Spy
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EXPLORATIONS

- Photo Matching
(Exploring Magnification)
- Do You Know Your Rock?

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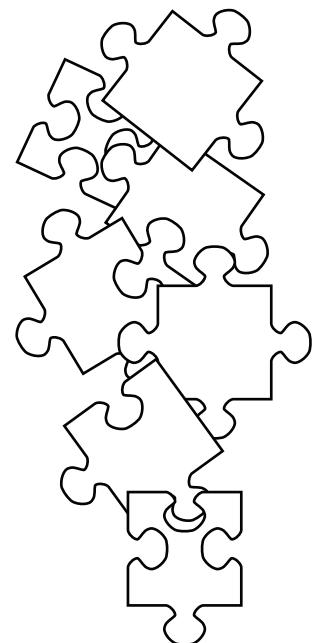
- Fingerprints and Footprints
- Listening Tool

ALL TOGETHER

- *Treasure Hunters*
- Goldilocks Mystery

CONNECTIONS

- More Ideas



Super Sleuths: All Together



The Goldilocks Mystery

Putting detective skills to the test in a “real” mystery is lots of fun. Observing, deduction and reasoning are all put in to practice.

What you need

- A copy of *Goldilocks and the Three Bears*
- Animal footprints (wolf/big dog, cat)
- Hair samples (three: one for the wolf, one for the cat, one for Goldilocks, plus extra for evidence)
- Dirty porridge bowl and spoon
- Map showing route from three suspects’ houses to bears’ house (Goldilocks’ route most prominent)
- Felt board with suspects (optional)
- A confession letter from Goldilocks
- Magnifying glasses

Note: find templates you can use at the back of this package

Hands on

1. Prepare the evidence listed above.
2. Review the story with the children.
3. Tell them Goldilocks says the story is not true. Yes, she slept in Little Wee Bear’s bed. However, she says she did not eat the porridge or break the chair.
4. Have the children be the detectives and find out if Goldilocks is telling the truth. Remind them they will need their observation skills and to be really good at noticing detail. They can use magnifying glasses as detective tools to help them. Tell them “I went to the Three Bears’ house and looked around. I found a few clues that might help us figure out if Goldilocks is telling the truth and if she is, who else might have eaten the porridge and broken the chair.”

Here is what I found:

- Footprints, two types
- Hairs
- Dirty porridge bowl
- A scrunched up piece of paper (the map)

Potential suspects:

- Goldilocks
- Puss in Boots
- Big Bad Wolf

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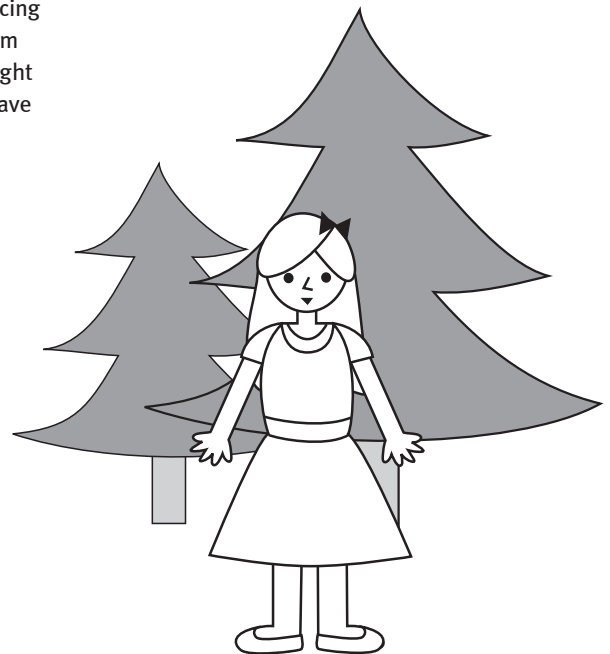
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- Listening Tool

ALL TOGETHER

- Treasure Hunters
- *Goldilocks Mystery*

CONNECTIONS

- More Ideas



Super Sleuths: All Together



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5. What the children will do:
 - a. Compare footprints.
 - b. Examine hairs found on Mama Bear’s chair (belonging to Puss in Boots).
 - c. Examine the paper (implicating Goldilocks).
 - d. Look at the porridge bowl, note the hair in it (belonging to Goldilocks).
6. Decide what might really have happened. What are some theories?
7. Read letter from Goldilocks confessing and apologizing.
Congratulate the children on being great detectives.

Questions to ask

What kind of clues should we look for? What kinds of things might our three suspects have left behind?

Who was in the house? How do we know?

What do you notice about the footprints? Who might they belong to? How do you know?

Who do the hairs belong to? How do you know?

What does the paper have on it? Where is it a map to?

What do you see in the porridge bowl? Are there any clues to who might have eaten it?

What next?

Read some detective stories or create more mysteries to solve.

Notes for next time

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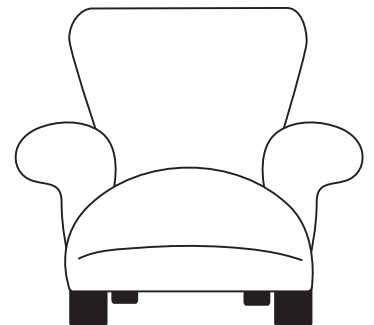
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- *Goldilocks Mystery*

CONNECTIONS

- More Ideas



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More Ideas

Sleuth and Sense Songs, Rhymes and Circle Games

- *I Spy With My Little Eye*
- *Where is Thumbkin?*
- *Teddy Bear's Picnic*
- *Going on a Lion Hunt*
- *Do Your Ears Hang Low?*

Sleuth Snacks

- Taste test your snacks: in a fruit salad, can you tell which fruit is which?
- Jelly Belly™ jellybeans: get some of the wacky flavours and see if you can taste what they are.

Children's Books about Sleuths, Mysteries or Senses

- *What Am I?* by Linda Granfield 🍁
- *We'll All Go Exploring* by Maggee Spicer and Richard Thompson 🍁
- *Sally Dog Little Undercover Agent* by Bill Richardson 🍁
- *Lickety-Split* by Robert Heidbreder 🍁
- *Clever Rachel* by Debby Waldman
- *I Spy Little Series* by Jean Marzollo
- *What Neat Feet!* by Hana Machotka

Resources for teachers

- Jim Wiese books like *Detective Science* and *Spy Science* 🍁
- *Preschool Pathways to Science* by Rochel Gelman, Kimberley Brenneman, Gay MacDonald and Moisés Román

Where to next?

INTRODUCTIONS

- Paint Chip Eye Spy
- Find the Ticking Clock

EXPLORATIONS

- Photo Matching
(Exploring Magnification)
- Do You Know Your Rock?

MAKE THIS

- Fingerprints and Footprints
- Listening Tool

ALL TOGETHER

- Treasure Hunters
- The Goldilocks Mystery

CONNECTIONS

- *More Ideas*



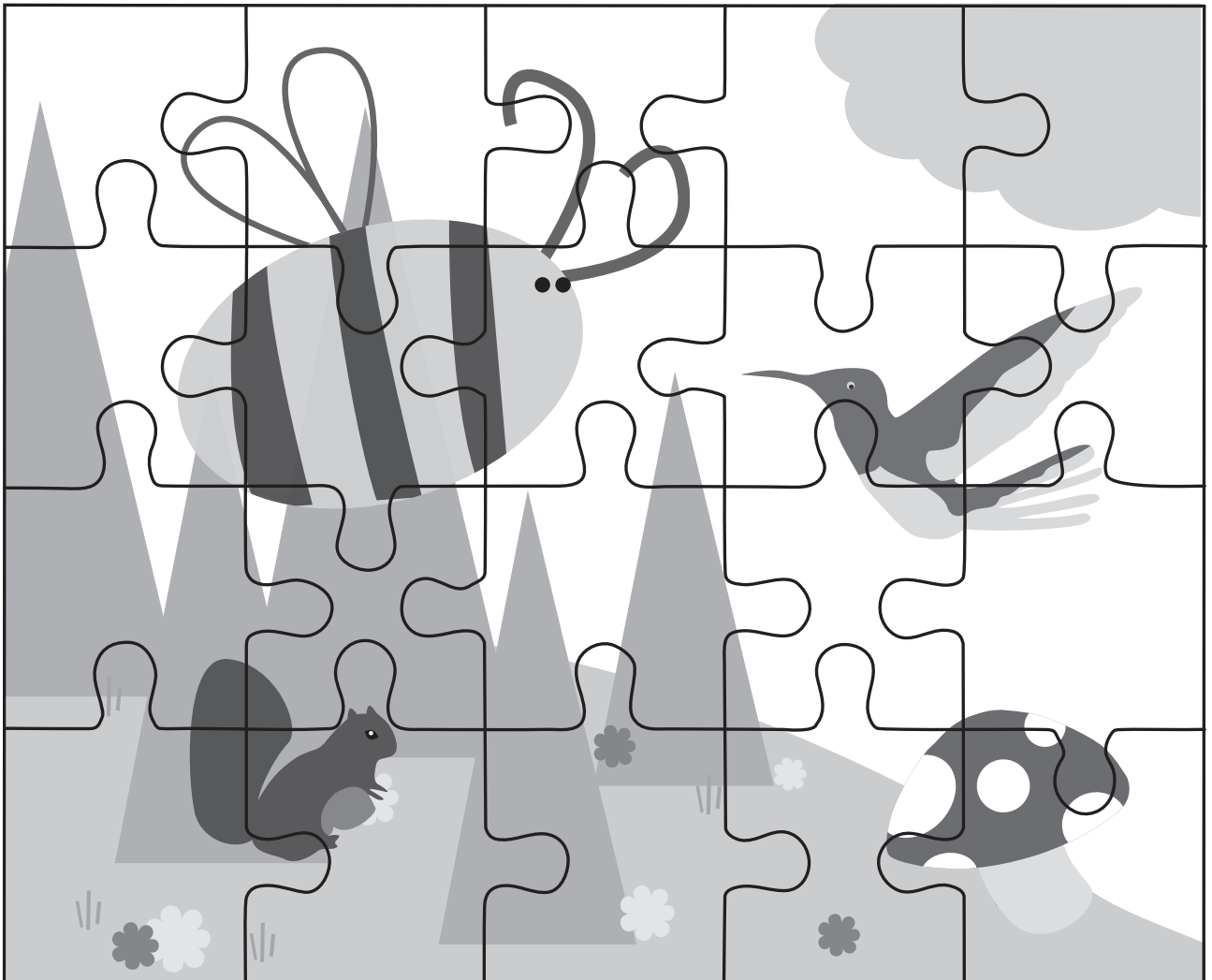
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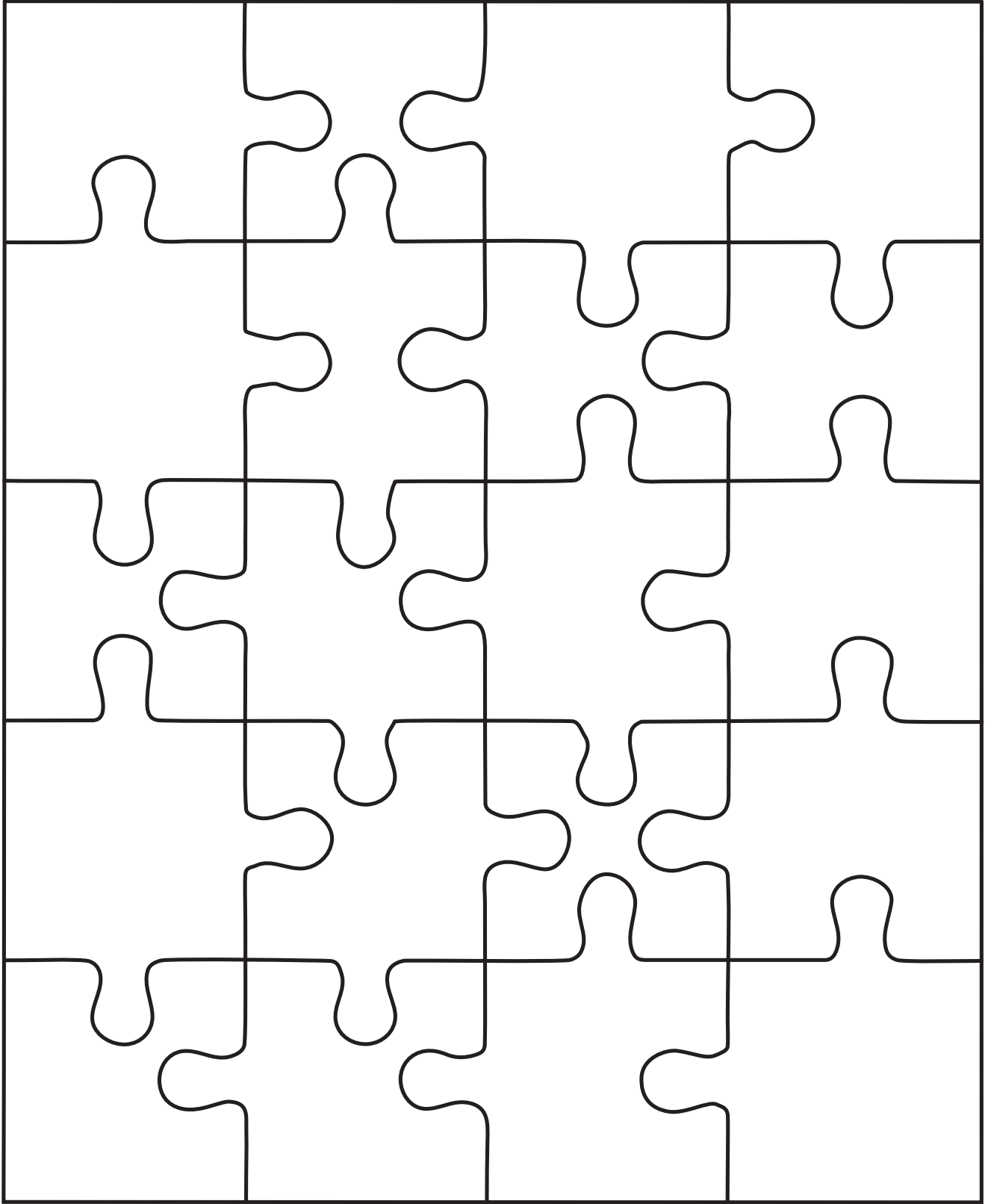
Work Sheet



Treasure Hunters

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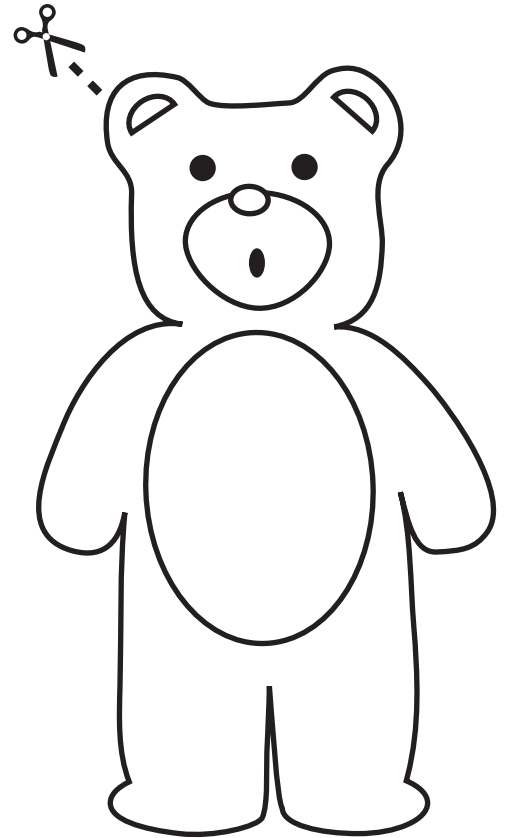
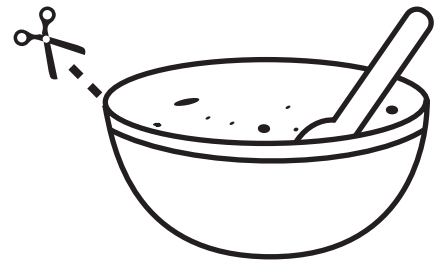
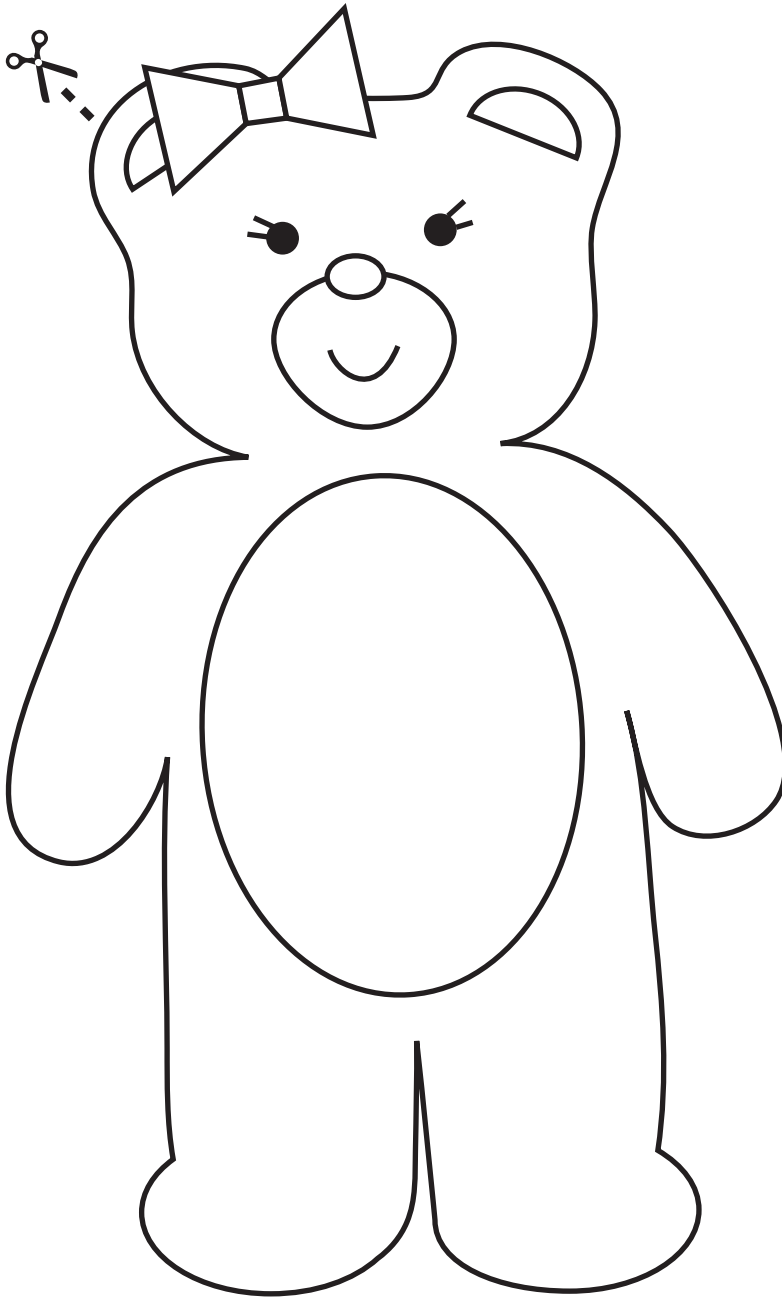
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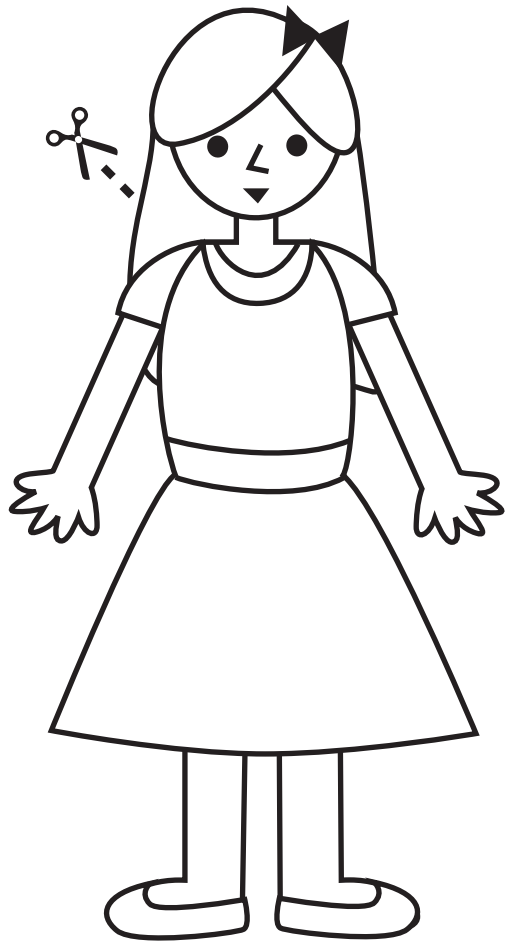
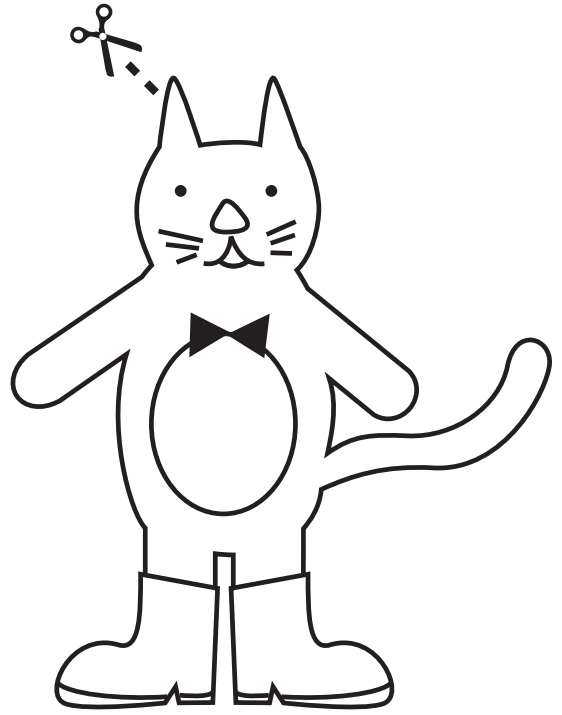
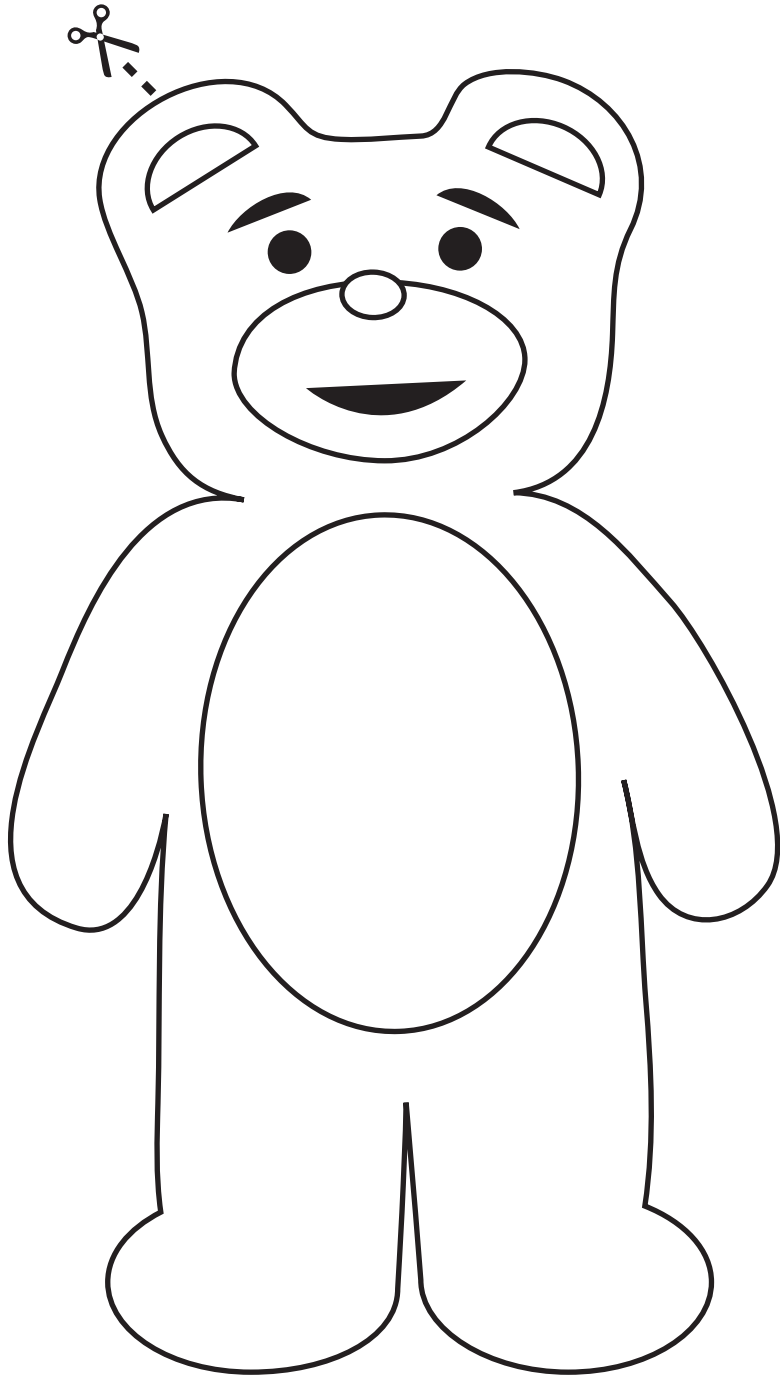
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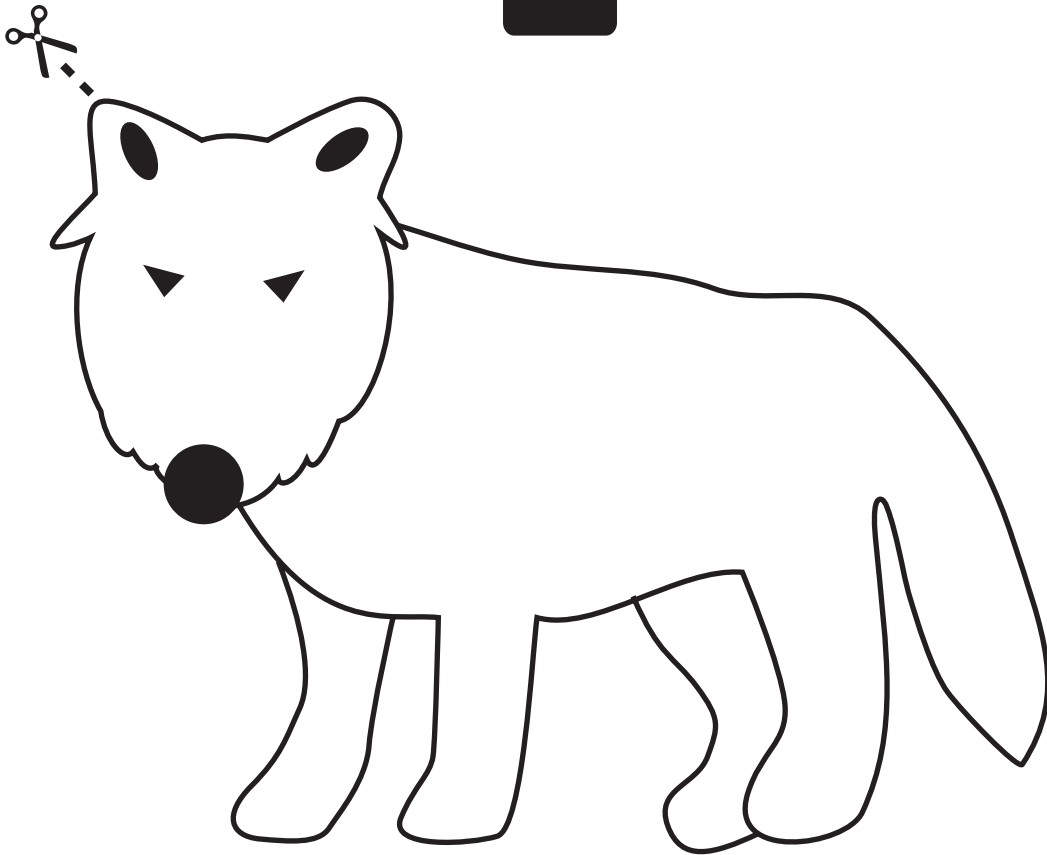
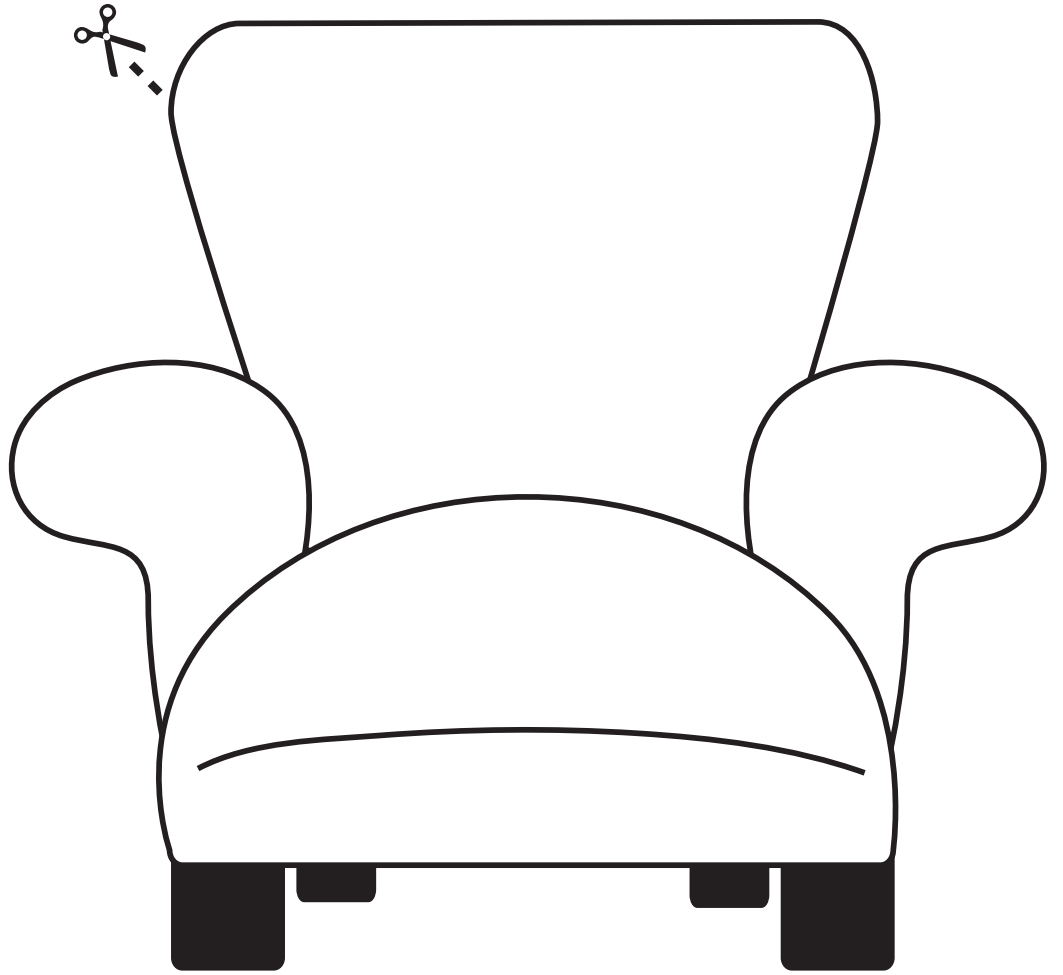


The Goldilocks Mystery

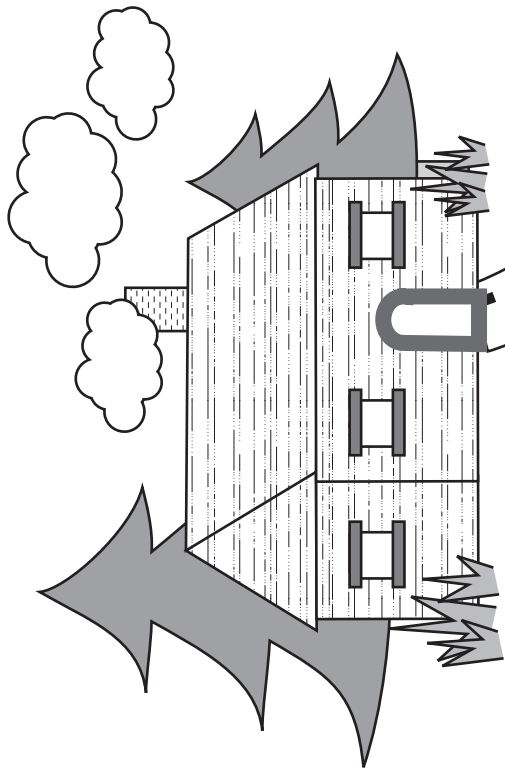
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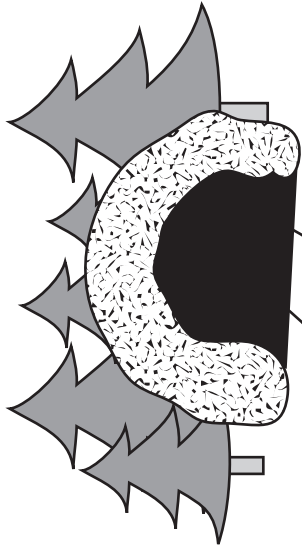
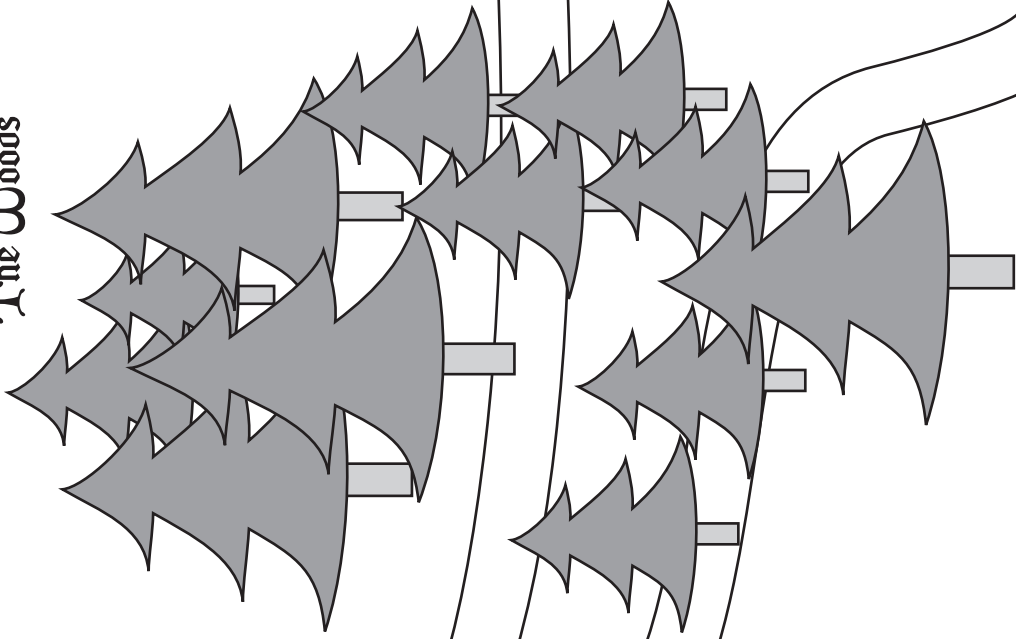


MAP

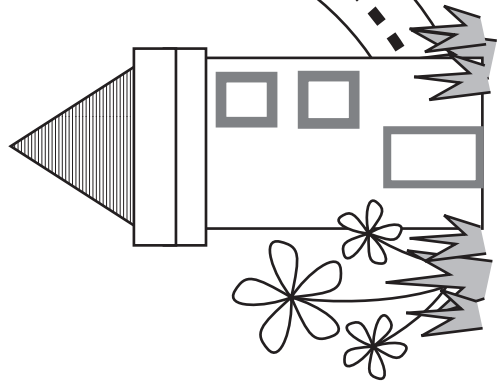


3 Bears' House

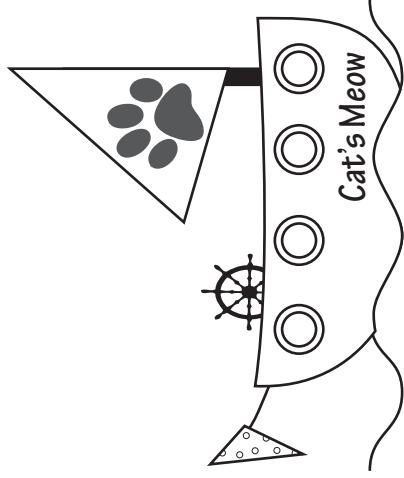
The Woods



Big Bad Wolf's Den



Goldilocks' House



Puss in Boot's Boat



Wolf's footprint



Cat's footprint

Dear Friends:

I'm sorry I lied about eating the porridge and breaking the chair. I did do those things, but I was afraid to tell you because I didn't want you to be mad at me. I know what I did was wrong.

I have apologized to Puss in Boots and the Big Bad Wolf for making it seem like it might be their fault.

I'm going to make it up to the Three Bears by cleaning their house and cooking them a delicious meal.

**Sincerely,
Goldilocks**