

LEARNING LAB WITH KRYSTAL CHURCHER

Shadows & Light

Explore • Create • Build

Practical activity guide for early learning educators



Testing how light passes through a window in a low block structure.

Learning Lab with Krystal Churcher

The Churcher Group

Nine activities • Ages 12 months to 4 years

ChildFriendly

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Put the learning into practice

Nine short, open-ended activities across three ages. Each page shows what to gather, how to set up, how to guide the experience, and a ready-to-adapt message for families.

Choose your starting point

	●●● 12–18 months	●●● 19–36 months	●●● 3–4 years
EXPLORE	Hand and Object Shadows p. 3	Appearing and Disappearing Shadows p. 4	Bigger and Smaller Shadows p. 5
CREATE	Marks and Moving Shadows p. 6	Drawing with Toy Shadows p. 7	Shadow Characters and Stories p. 8
BUILD	Blocks and Changing Light p. 9	A Garage with Light p. 10	Structures with Windows p. 11

Ages are a guide, not an expectation. Choose the activity that fits the children in front of you.

Before you begin

- **Test first.** Try the light and shadow effect before inviting children.
- **Keep some room light on.** Complete darkness is unnecessary and makes moving around less safe.
- **Secure the light.** Use a cool LED flashlight on a stable surface or stand, aimed away from children's eyes. Check that battery compartments are closed securely.
- **Choose suitable materials.** Use large, age-appropriate items with no small or detachable parts.
- **Prepare openings.** Adults cut cardboard openings and check for sharp edges.
- **Build low and stable.** Keep structures low and supervise closely throughout.

Every way of taking part counts

Watching, pointing, moving, speaking and directing a partner are all ways to participate. Offer reachable materials, seating or standing options, easy-grip tools and help when asked. Follow children's interests rather than a set outcome.

Sharing learning with families

Describe what the child actually did, the learning that action supported, and how you will build on it. Use their exact words when you can. One experience is a beginning, not mastery.

What they did → What it supported →

What's next

Hand and Object Shadows

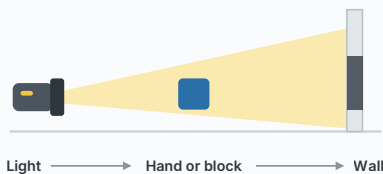
An educator makes a slow shadow on the wall, then invites the child to explore with their own hand or a large block.

GATHER

- ☐ LED flashlight, held by an educator
- ☐ Plain wall, or white paper taped securely to the wall
- ☐ One large opaque block or sturdy toy

SET UP

SETUP DIAGRAM



Seat the child facing the wall with a clear view. Sit beside the beam, not in it, so your body does not block the light. Keep the room lights on.

INVITE AND EXPLORE

- 1 Hold the flashlight steady. Slowly move your hand into the beam, spread your fingers, then pause. Give the child time to look from your hand to its shadow.
- 2 If the child reaches, make room for their hand in the beam. Offer the block if they prefer an object.
- 3 Adjust the beam so the child's movement makes a clear change on the wall.
- 4 Follow their lead. Repeat when they point, reach or ask for more; stop or adjust when they turn away or seem unsure.

WHY IT MATTERS

When a child lifts the block and then glances at the wall, they are linking their own action to what changes, an early way of exploring cause and effect. Following a moving shadow builds visual attention, and reaching into the beam practises coordination. Looking back and forth between you and the wall is shared attention, a foundation for communication.

WORDS TO TRY

"There's the shadow."

"Your hand moved."

"Again?"

Use short words and long pauses. Naming or explaining the shadow is not expected.

NOTICE AND EXTEND

- LOOK FOR** Looking toward the wall after moving the block, reaching again, or handing you the block to repeat an action.
- NEXT STEP** Offer the same setup again on another day before adding more objects.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] lifted a block, watched its shadow move on the wall and then lifted it again. They were noticing that their own movement changed what they could see, while practising how to reach and hold. We will offer the same setup again so they can keep exploring at their own pace."

Appearing and Disappearing Shadows

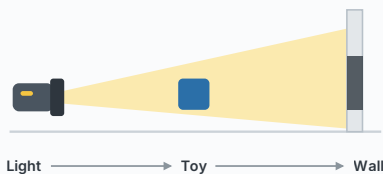
Toddlers move familiar toys into and out of a steady beam of light to make shadows appear and disappear.

GATHER

- ☐ LED flashlight, secured on a shelf or stand
- ☐ Plain wall or white background
- ☐ Two or three large opaque toys, such as an animal, a block and a cup

SET UP

SETUP DIAGRAM



Secure the light at toddler height and aim it at the wall. Test each toy first. Place the toys within reach beside the beam, leaving room for the child to sit or stand without blocking the light.

INVITE AND EXPLORE

- 1 Invite the child to choose a toy. Show where the beam is with your hand, then let them find a spot that makes a shadow.
- 2 When the toy leaves the beam, pause. Invite the child to bring the shadow back rather than repositioning the toy for them.
- 3 Allow plenty of repeats. Doing it again and again is where the exploring happens.
- 4 If interest continues, offer one new toy, or invite the child to turn the first toy and watch the shape change.

WHY IT MATTERS

Each time a toddler pulls a toy out of the light and pushes it back in, they are testing an idea: my action makes the shadow come and go. Placing the toy in the beam builds hand-eye coordination, and turning it invites them to compare shapes. Hearing words such as in, out and turn alongside their own movements connects language to action.

WORDS TO TRY

"You put the bear in the light."

"Where did its shadow go?"

"Can you make it come back?"

Accept gestures and actions as answers.

NOTICE AND EXTEND

LOOK FOR Deliberately returning a toy to the beam, or turning it while watching the wall.

NEXT STEP Add one new shape rather than a full basket of materials.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] moved a toy out of the light and then brought it back to make its shadow reappear. They repeated this several times, exploring how their actions changed what they could see. We used words such as in, out and turn as they played."

Bigger and Smaller Shadows

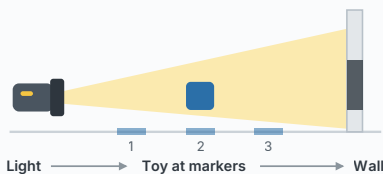
Children predict and test how moving an object closer to or farther from the light changes the size of its shadow.

GATHER

- ☐ LED flashlight, fixed in place
- ☐ One opaque toy or cardboard shape
- ☐ Plain wall
- ☐ Three flat tape markers
- ☐ Optional: paper and crayons

SET UP

SETUP DIAGRAM



Fix the flashlight and aim it at the wall. Place three flat tape markers in a line between them, all within the beam. Test for a clear size change. The light and wall stay still; only the object moves.

INVITE AND EXPLORE

- 1 Hold the object at the middle marker. Ask what might happen if it moves closer to the flashlight. Accept every prediction and invite a test.
- 2 Move the object to the marker nearest the light, then to the one nearest the wall. Keep its height and angle the same so distance is the only change.
- 3 Compare the results. In this setup, closer to the light makes a bigger shadow; closer to the wall makes a smaller one.
- 4 Invite children to return to a marker and make the same shadow again. Offer drawing as an optional way to record what they notice.

WHY IT MATTERS

Making a prediction and then moving the toy to check it is the heart of inquiry. Comparing two shadow sizes builds careful observation and spatial reasoning. Because only the distance changes, children can see the relationship clearly and return to a marker to test it again.

WORDS TO TRY

"What do you think will happen closer to the flashlight?"

"What changed?"

"Can you make the smaller shadow again?"

Say "closer to the light" or "closer to the wall", not just "closer".

NOTICE AND EXTEND

LOOK FOR Size comparisons in children's words, and deliberate repositioning to recreate a result.

NEXT STEP Keep the distance the same and investigate what happens when children turn the object.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] predicted what would happen to a shadow, then moved a toy closer to the flashlight to find out. They noticed the shadow getting bigger and tried the movement again to check. This gave them opportunities to predict, compare and test an idea."

Marks and Moving Shadows

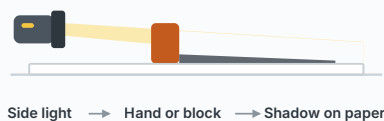
Children explore making marks on paper while an educator slowly moves a hand or block shadow nearby.

GATHER

- ☐ Large paper, taped down
- ☐ One or two chunky, age-appropriate crayons
- ☐ LED flashlight, held by an educator
- ☐ One large opaque block

SET UP

SETUP DIAGRAM



Tape the paper to a low table or the floor. Hold the light low and to one side so your hand or the block casts a shadow across the paper. Check that the child can reach the paper comfortably.

INVITE AND EXPLORE

- 1 Offer the crayons first. Let the child explore making marks with no other request.
- 2 Cast a still shadow on an empty area of the paper. If the child notices it, move it slowly a short distance, then pause.
- 3 Follow the child's response. Watching, patting the shadow, reaching and carrying on drawing are all ways to take part.
- 4 Supervise the crayons closely and respond to mouthing. End when the child shows they are finished.

WHY IT MATTERS

Gripping a chunky crayon and pushing it across the paper builds grasp and arm coordination, and seeing a mark appear shows the child that their movement made something happen. Patting a shadow or watching it slide away invites curiosity about what moves and what stays. Choosing a crayon is an early decision, and looking up to share it with you is communication.

WORDS TO TRY

"You made a mark."

"There's the shadow."

"It moved!"

Tracing a shadow is not an expectation at this age.

NOTICE AND EXTEND

LOOK FOR Which crayon the child chooses, repeated marks, and attention shifting between their marks and the shadow.

NEXT STEP Repeat with the same materials. Add another crayon only if it supports the child's interest.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] made marks on a large sheet of paper while a shadow moved across it. They chose a crayon and made repeated strokes, practising their grip and coordination, and paused to watch the shadow. At this age the learning is in exploring movement and materials, so we will offer this experience again."

Drawing with Toy Shadows

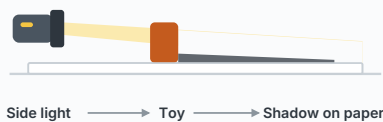
Toddlers choose a toy, position its shadow on paper, and make marks beside, across or around it.

GATHER

- ☐ Large paper, taped down
- ☐ Chunky crayons
- ☐ Two or three large toys or blocks
- ☐ LED flashlight, secured low

SET UP

SETUP DIAGRAM



Secure the flashlight low and to one side, angled across the paper. Test a toy's shadow and leave open space for drawing. Seat the child beside the shadow, not between the toy and the light.

PHOTO TO SUPPLY

Toy shadow across paper beside chunky crayons

assets/photo-create.jpg

A toy's shadow falls across taped-down paper, with crayons close by.

INVITE AND EXPLORE

- 1 Invite the child to choose a toy and where to put it. Help them find the beam while keeping their choice.
- 2 Offer a crayon. Scribbling, drawing beside the shadow's edge and moving the toy again are all valid choices.
- 3 If the child wants to trace and the toy keeps shifting, offer to hold it steady.
- 4 Notice together that the shadow moves while the marks stay. Let the child decide when the picture is finished.

WHY IT MATTERS

Choosing where to place the toy and finding the beam is early spatial problem-solving. Drawing near the shadow's edge builds fine motor control. When a child tells you what their marks mean, they are exploring representation: the idea that marks can stand for something. Talking about their choices connects new words to what they are doing.

WORDS TO TRY

"Where would you like your animal?"

"You drew beside its shadow."

"The shadow moved. Your marks stayed!"

Use the child's meaning rather than naming the picture for them.

NOTICE AND EXTEND

LOOK FOR Deliberate placement of the toy, repeated marks, and any meaning the child gives their drawing.

NEXT STEP Invite a partner to hold the toy so the child can keep the shadow steady while drawing.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] chose an animal, moved its shadow across the paper and added marks beside it. They practised coordinating their drawing movements and made their own choices about where to place the toy and the crayon. We followed their ideas rather than asking them to copy an outline."

Shadow Characters and Stories

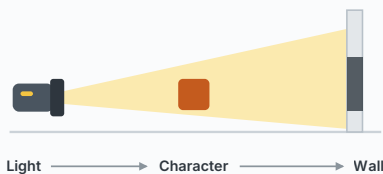
Children make simple cardstock characters, test their shadows and bring them to life through movement and story.

GATHER

- ☐ Cardstock and ready-cut shapes
- ☐ Markers and tape
- ☐ Child-safe scissors
- ☐ Broad cardboard handles or wide craft sticks
- ☐ LED flashlight, secured
- ☐ Plain wall

SET UP

SETUP DIAGRAM



Set up a making table and a separate light area close by. Secure the flashlight a short distance from the wall, with room for children to stand beside the beam rather than in it.

INVITE AND EXPLORE

- 1 Children choose a character or start with a ready-cut shape. They can draw and cut, or direct an adult to help.
- 2 Tape a broad handle to the back for a comfortable grip.
- 3 Test the character in the light and compare the card with its shadow. Drawn details will not show, but the outline will. Children can change the outline or ask an adult to help cut an opening.
- 4 Invite a short story through movement, words or both. Add a second character when children want to play together. No rehearsed performance is needed.

WHY IT MATTERS

Cutting and handling a character builds fine motor skill and planning. Discovering that drawn eyes do not appear in the shadow, then deciding to cut an opening, is genuine problem-solving. Moving a character through “what happens next” builds narrative language, and sharing a story with a friend creates opportunities to negotiate ideas.

WORDS TO TRY

“Who is your character?”

“What can you see in its shadow?”

“What happens next?”

Pause and give children time to share their ideas.

NOTICE AND EXTEND

LOOK FOR Changes children make after testing, and how they connect events in their story.

NEXT STEP Write down children’s exact words, or bring the characters back for another story another day.

Share the Learning with Families

Personalize this example using what you observed.

“Today, [name] created a shadow character and changed its shape after testing it in the light. They then used it to tell a short story. This brought together planning, problem-solving and storytelling as their ideas developed through making and play.”

Blocks and Changing Light

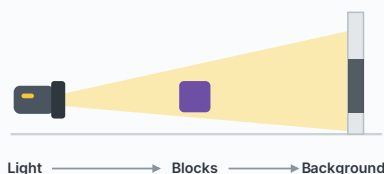
Children place, remove and stack a few large blocks while an educator draws attention to the changing light and shadows.

GATHER

- ☐ Large, lightweight blocks
- ☐ LED flashlight, secured
- ☐ Plain background
- ☐ Optional: sturdy box with an open back and one wide, smooth-edged front opening

SET UP

SETUP DIAGRAM



Create a low building space on the floor with the light, blocks and background in that order. If using the box, place it so the light shines in through the open back and out through the front opening.

INVITE AND EXPLORE

- 1 Place a block in the beam, then slowly remove it. Pause, then set the block within the child's reach.
- 2 With the box, cover part of the opening, then uncover it. Keep the light still so only the blocks change.
- 3 Follow the child's interest in moving, placing or stacking. Keep towers low.
- 4 If the child focuses on the blocks rather than the shadows, follow their lead. That is valuable exploration too.

WHY IT MATTERS

Grasping and letting go of a block builds hand control, and placing one block on another is an early spatial experience. When a block in the beam changes the light on the background, the child has a repeatable chance to explore cause and effect, even before they have words to describe it.

WORDS TO TRY

"Block here."

"You moved it."

"Look, a shadow."

"Again?"

Make one brief comment, then allow time to repeat.

NOTICE AND EXTEND

LOOK FOR Repeated placement, glances toward the background, or handing you a block to repeat an action.

NEXT STEP Keep the same setup available for several days before adding anything new.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] placed and removed large blocks while we noticed the light changing. Moving the blocks gave them practice with grasping, letting go and positioning. We will repeat the experience so they have time to explore the materials and what they can do."

A Garage with Light

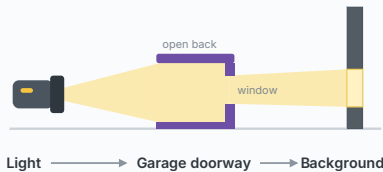
Toddlers build and play around a simple garage doorway, discovering how vehicles and blocks block the light.

GATHER

- ☐ Box with an open back and a wide, smooth-edged front doorway
- ☐ Blocks
- ☐ One large toy vehicle
- ☐ LED flashlight, secured
- ☐ White background
- ☐ Optional: large people figures; small fabric curtain

SET UP

SETUP DIAGRAM



Shine the light in through the open back of the box and out through the doorway toward the background. Position children beside the beam with easy access to the doorway.

INVITE AND EXPLORE

- 1 Offer one vehicle and a few blocks. Invite the child to drive through the doorway or build around it.
- 2 When a block or vehicle covers the doorway, pause and notice the change in light. Ask how they could let the light through again.
- 3 Follow pretend play about driving in, parking or building.
- 4 When children are ready, add a second opening or a small fabric curtain with close supervision. Notice that some fabrics let more light through than others.

WHY IT MATTERS

Judging whether the vehicle will fit through the doorway is spatial reasoning in action. Clearing a block from the opening to let the car, and the light, pass through is hands-on problem-solving. Covering and uncovering the doorway invites cause-and-effect investigation, with useful words such as open, covered and through.

WORDS TO TRY

"You covered the opening."

"How can we let the light through?"

"The car needs a way in."

Describe what happens rather than asking for explanations.

NOTICE AND EXTEND

LOOK FOR How the child changes the doorway or removes an obstacle to let the vehicle or light through.

NEXT STEP Later, offer a different-sized vehicle or a new opening, one change at a time.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] moved blocks to reopen a garage doorway so a vehicle and the light could pass through. They explored what fits, noticed an obstacle and tried a solution. We used words such as open, covered and through during their play."

Structures with Windows

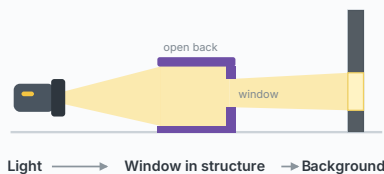
Children design a low structure with openings, test where the light passes through, and revise their design.

GATHER

- ☐ Building blocks
- ☐ Sturdy cardboard panels
- ☐ Lightweight spanning pieces, such as long flat blocks
- ☐ LED flashlight, secured
- ☐ Plain background
- ☐ Optional: paper, crayons and a camera

SET UP

SETUP DIAGRAM



Prepare a stable, uncluttered building space between the light and the background. Line the light up behind where children are building so they can test their openings.

PHOTO TO SUPPLY

Low block structure with an opening, light passing through

[assets/photo-build.jpg](#)

Light passes through the window of a low block structure.

INVITE AND EXPLORE

- 1 Invite children to build something with an opening that lets light through. They can plan by drawing or by arranging pieces.
- 2 If needed, offer two low supports and a lightweight piece long enough to rest securely across both.
- 3 Line the light up behind the opening and test it. Ask what children notice before suggesting a change.
- 4 Invite one change: widen the window, add another or strengthen the top. Test again. If a piece falls, help children adjust the supports or choose a different piece.

WHY IT MATTERS

Planning a window, testing it and deciding what to change takes children through a full design cycle. Balancing a piece across two supports builds spatial reasoning and an early sense of stability. Comparing versions invites reflection, and asking a friend to steady a piece creates opportunities to collaborate.

WORDS TO TRY

"Where will the light pass through?"

"What could you change?"

"How could you keep the window from falling?"

Give children time to test their own solutions first.

NOTICE AND EXTEND

LOOK FOR Changes that follow testing, and how children explain their choices.

NEXT STEP With appropriate permissions, photograph two versions and invite children to compare them. Drawings work too.

Share the Learning with Families

Personalize this example using what you observed.

"Today, [name] built a structure with a window, tested it with the light and then changed the design. They practised planning and problem-solving by using what happened to decide what to try next. We will look back at the versions together and invite them to explain their choices."