FUNtastic Christmas Science

Theo & Tilda's

Screen-Free Advent Calendar

DECEMBER 1–24 • FREE TO SHARE • AGES 3–9



PLUS 4 WEEKEND LABS WITH JANKA'S REAL PHOTOS



LAB 1 Walking-Water Advent Wreath



LAB 2 Upside-Down Water Glass



LAB 3 Paper Clip on Water's Skin



LAB 4 Salt Snow and Oil Bubbles

24 tiny wonders • 24 kindness missions • 4 Weekend Labs • 3 games



Janka Sára Molnár PHYSICIST

- ★ **FORBES NEXT: 30 talented young people under 30 from the world of science – 2018**
- ★ **Role Model Award, Innovation** · Nők Lapja 2026
- ★ **Rising Star Award** · Creator Awards 2024

christmas-science.com

A4 EDITION · 210 × 297 mm · print at 100%

A Note from Janka

FOR PARENTS AND TEACHERS



Static electricity at work!

Dear Parents and Teachers,

December is full of screens, lists, and rushing. This little calendar gives you 24 tiny moments to slow down together: one small wonder and one kind deed a day, with no screens and no shopping.

Most activities take about 10 minutes and use things you probably already have: a glass of water, a flashlight, a sheet of paper. A grown-up is always there, and the few steps that need one are clearly marked.

Ask "What do you think will happen?" first, then try it, then wonder together why. That is how real scientists work, and it is quality FUN time for all of you.

With love from my lab to your kitchen,

Janka

Janka Sára Molnár · physicist and founder of FUNtastic Christmas Science

MY FOUR TIPS FOR GROWN-UPS

1. Ask before you explain. "What do you think will happen?" is the best question in science.
2. Keep it tiny. Ten minutes is enough, and stopping while it's still fun makes tomorrow exciting.
3. Notice the kindness out loud. "I saw you help Grandma" means more than any sticker.
4. No printer? Read the day's card aloud from the screen, then put the screen away and play.

Juhari Zsuzsanna Blog of the Year Award
Hungarian Academy of Sciences, 2023

Rising Star Award
Creator Awards, 2024

Role Model Award, Innovation
Nők Lapja, 2026



See you on December 1!
Theo and Tilda can't wait to wonder with you.

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How It Works

One card for every day from December 1 to 24. Each card has a tiny wonder, the science behind it, and a kindness mission. For weekends and holidays, there are four bigger experiments and three games.



1. Cut out the Advent cards

Cut out the 24 Advent cards along the dashed lines. Roll them up with a ribbon, or slip them into envelopes, little socks, or a jar.



2. One card a day

Open one card each day from December 1 to 24. Read it together, try the tiny wonder, and talk about the why.



3. Do the kindness mission

Every day has a value, like patience or honesty, and a small mission to practice it.



4. Color an ornament

When you finish a day, color its ornament on the Advent tree. On Christmas Eve, your tree is full!



THE TINY WONDER ROUTINE

Guess. "What do you think will happen?"

Try. Do the tiny wonder together.

Wonder why. Read the "Why?" box and talk about it.

Be kind. Do the kindness mission before bedtime.

SAFETY: A grown-up is always there. Keep small things (crayons, lentils, corks, keys, magnets, paper clips, buttons, coins, dice, small toys) away from children under 3. Grown-ups poke holes and help with scissors. Use warm, never hot, water. Don't eat the sprouts. Never look straight at the Sun.

Starting late? No problem. Start with today's card, or catch up with two tiny wonders a day. Every card stands on its own.

PRINTING TIPS: Print single-sided on A4 paper or light cardstock (thin card), at 100% ("Actual size"). Cut out the Advent cards (pages 6–11), the Memory Game cards (page 16), and the Wonder Cards (page 19). Grown-ups, please do the cutting for younger children. Short on ink? Start with the Advent cards (pages 6–11).



The Big Experiment of the Day

At the bottom of each card, you'll find the big experiment of the day from the 24-day December plan in *Theo & Tilda's Christmas Science Adventure*. Days 1–5 are free in our sampler at christmas-science.com.

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Your 24 Days at a Glance

Each day: a tiny wonder, the value of the day, and the big experiment from the book's 24-day December plan.

1. **Fog Drawings** — Gratitude · Book: Milk Fireworks FREE SAMPLER
2. **The Ice Cube Watch** — Patience · Book: Magic Snow FREE SAMPLER
3. **Reindeer Heartbeat** — Empathy · Book: Lava Lamp FREE SAMPLER
4. **No Two Alike** — Acceptance · Book: Candy Rainbow FREE SAMPLER
5. **The Paper Bridge** — Teamwork · Book: Foam Mountain FREE SAMPLER
6. **Sprout Watch** — Patience · Book: Giant Gummy Bear
7. **Warm or Cool?** — Empathy · Book: Pepper Skaters
8. **Bouncing Light** — Generosity · Book: Fizzing Mustard
9. **The Magnet Hunt** — Helpfulness · Book: Static Balloon
10. **The Tallest Tower** — Perseverance · Book: Floating Egg
11. **Shadow Puppets** — Cooperation · Book: Oil Droplets
12. **Frost Detective** — Perseverance · Book: Cola Geyser
13. **Sink or Float?** — Learning from Mistakes · Book: Cabbage Colors
14. **Six-Armed Snowflakes** — Teamwork · Book: Self-Filling Balloon
15. **Heavy or Light?** — Honesty · Book: Melting Race
16. **Rainbow in a Glass** — Learning from Mistakes · Book: Liquid Tower
17. **The Ice Rescue** — Forgiveness · Book: Pink Snow Cloud
18. **Eyes in the Dark** — Courage · Book: Unpoppable Balloon
19. **The Cup Telephone** — Helpfulness · Book: Bubble Snake
20. **The Listening Minute** — Empathy · Book: Cabbage Flowers
21. **Lunchtime Shadows** — Acceptance · Book: Fizzy Lemons
22. **Color Mixing Magic** — Learning from Mistakes · Book: Marbled Swirls
23. **The Spinning Top** — Helpfulness · Book: Balloon Fountain
24. **Christmas Eve Starlight** — Gratitude · Book: Golden Snowfall

PLUS, FOR WEEKENDS AND HOLIDAYS

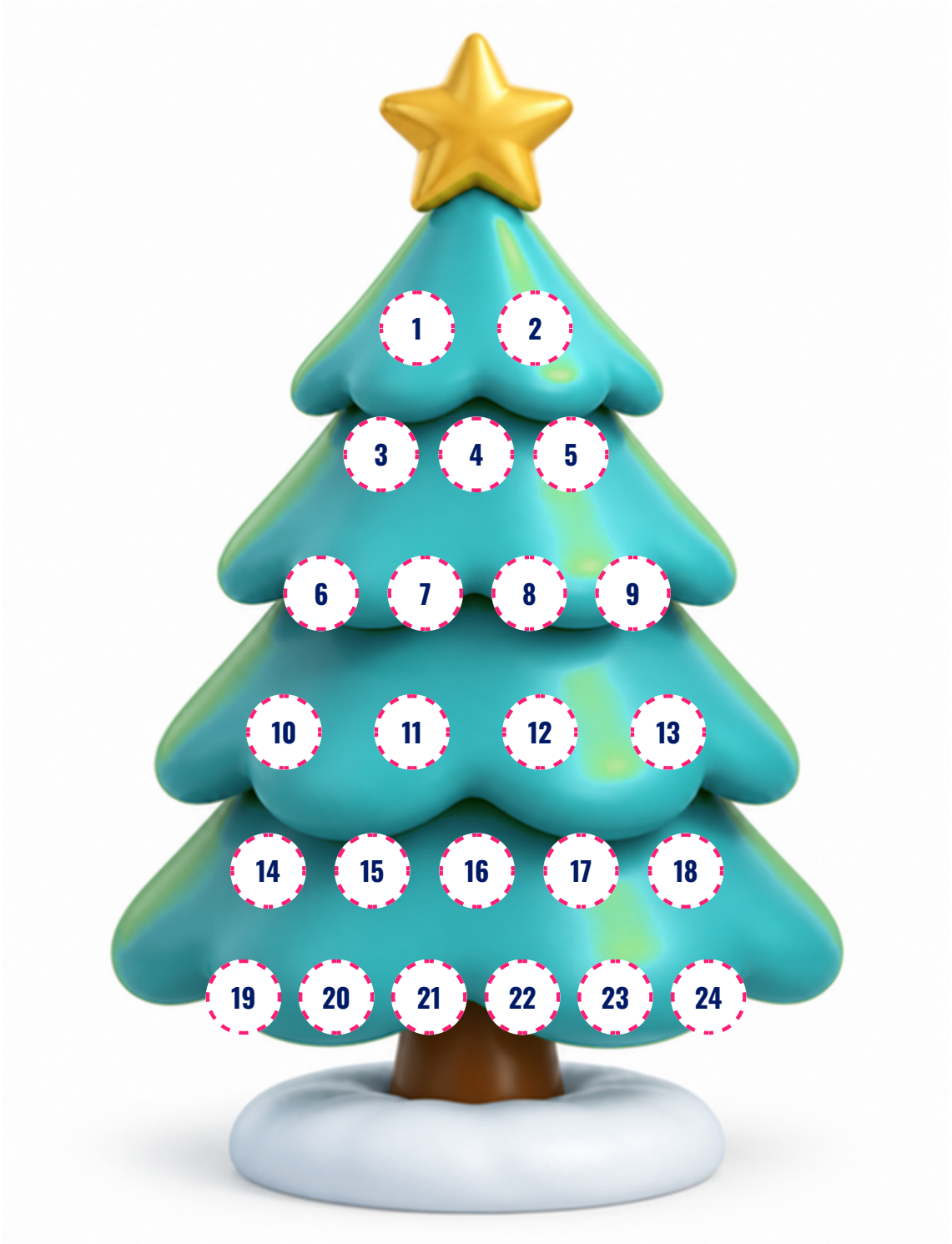
4 Weekend Labs pages 12–15
Advent Memory Game page 16
Winter Science Bingo page 17
Race to Christmas Eve pages 18–19

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My Advent Tree

Color one ornament for every day you finish. Can you fill the whole tree by Christmas Eve?



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Advent Cards 1–4

✂ Cut along the dashed lines

DEC 1 — DAY 1 OF 24 — Fog Drawings



TINY WONDER

Breathe on a cold window, a mirror, or a glass from the fridge. Quick, draw a star in the fog!

WHY? Your warm breath carries invisible water vapor. On the cold glass it cools and turns into tiny droplets: fog!

Gratitude KINDNESS MISSION

Thank three people today, and tell each of them why.

From the book: Milk Fireworks · free in our sampler

DEC 2 — DAY 2 OF 24 — The Ice Cube Watch



TINY WONDER

Put an ice cube on a plate. Guess how many minutes it will last, then check every 10 minutes.

WHY? The warmer air and plate keep giving heat to the ice, so it melts little by little.

Patience KINDNESS MISSION

When you have to wait today, hum a song or count snowflakes in your head.

From the book: Magic Snow · free in our sampler

DEC 3 — DAY 3 OF 24 — Reindeer Heartbeat



TINY WONDER

Jump like a reindeer 20 times, then put your hand on the left side of your chest. What do you feel?

WHY? Busy muscles need more oxygen, so your heart beats faster to bring it to them.

Empathy KINDNESS MISSION

Ask someone, "How was your day?" and really listen to the answer.

From the book: Lava Lamp · free in our sampler

DEC 4 — DAY 4 OF 24 — No Two Alike



TINY WONDER

Look closely at your fingertips, with a magnifying glass if you have one. Then compare them with a grown-up's. Same pattern?

WHY? Fingerprints form before we are born, and each one grows its own way. Nobody has ever found two people with the same ones, not even twins.

Acceptance KINDNESS MISSION

Tell a friend one thing you like about how they are different from you.

From the book: Candy Rainbow · free in our sampler

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Advent Cards 5–8

✂ Cut along the dashed lines

DEC 5 — DAY 5 OF 24 — The Paper Bridge



TINY WONDER

Lay a sheet of paper across two books like a bridge. How many crayons can it hold? Now fold it like a fan, move the books closer, and try again.

WHY? The folds make the paper stiff, so the bridge can carry much more.

Teamwork **KINDNESS MISSION**

Build something together, and let everyone add one part.

From the book: Foam Mountain · free in our sampler

DEC 6 — DAY 6 OF 24 — Sprout Watch



TINY WONDER

Put a few whole dried lentils (green or brown, not red split ones) on a wet paper towel in a glass. Keep the towel damp and check every morning.

WHY? Water wakes the seeds up. In a few days, a tiny root pokes out to drink.

Patience **KINDNESS MISSION**

Give your sprouts a little water every day until Christmas.

From the book: Giant Gummy Bear

DEC 7 — DAY 7 OF 24 — Warm or Cool?



TINY WONDER

Dip one hand in cold water and the other in warm (not hot) water. Count to 30. Then put both hands in a bowl of room-temperature water.

WHY? Your skin feels changes in temperature. So the same water feels warm to one hand and cool to the other!

Empathy **KINDNESS MISSION**

Ask someone how something felt for them. People can feel differently about the same thing.

From the book: Pepper Skaters

DEC 8 — DAY 8 OF 24 — Bouncing Light



TINY WONDER

In a dark room, shine a flashlight at a mirror. Can you bounce the light onto the ceiling? Don't shine it in anyone's eyes.

WHY? A mirror reflects light. It sends the light off in a new direction.

Generosity **KINDNESS MISSION**

Share something with someone today: a toy, a treat, or your turn.

From the book: Fizzing Mustard

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Advent Cards 9–12

✂ Cut along the dashed lines

DEC 9 — DAY 9 OF 24 — The Magnet Hunt



TINY WONDER

Walk around the kitchen with a fridge magnet. What does it stick to? What doesn't it stick to?

WHY? Magnets pull on iron and most steel. Some stainless steel spoons and sinks are a surprise! Magnets don't pull on wood, plastic, paper, or aluminum foil.

Helpfulness **KINDNESS MISSION**

Help someone at home today without being asked.

From the book: Static Balloon

DEC 10 — DAY 10 OF 24 — The Tallest Tower



TINY WONDER

Build the tallest tower you can from plastic cups or blocks. When it falls, build it again with a wider bottom.

WHY? A wide, steady base keeps a tower from tipping over.

Perseverance **KINDNESS MISSION**

Try something hard again today, even if it didn't work the first time.

From the book: Floating Egg

DEC 11 — DAY 11 OF 24 — Shadow Puppets



TINY WONDER

Turn on a lamp and make shadow animals on the wall with a partner. Can you make a reindeer?

WHY? Your hands block the light, so a dark shape, a shadow, appears on the wall behind them.

Cooperation **KINDNESS MISSION**

Tell a shadow story together. Take turns adding one part each.

From the book: Oil Droplets

DEC 12 — DAY 12 OF 24 — Frost Detective



TINY WONDER

Look closely at frost on a window or inside the freezer. Use a magnifying glass if you have one.

WHY? On very cold surfaces, water vapor from the air freezes straight into tiny ice crystals.

Perseverance **KINDNESS MISSION**

Practice something for five minutes today, like writing your name or tying a bow.

From the book: Cola Geyser

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Advent Cards 13–16

✂ Cut along the dashed lines

DEC 13

DAY 13 OF 24

Sink or Float?



TINY WONDER

Pick six things: an apple, a spoon, a crayon, a cork, a key, and a leaf. Guess first, then test them in a bowl of water.

WHY? Things float when they are lighter than a same-sized blob of water.

Learning from Mistakes **KINDNESS MISSION**

Count your wrong guesses. Each one taught you something new!

From the book: Cabbage Colors

DEC 14

DAY 14 OF 24

Six-Armed Snowflakes



TINY WONDER

With a grown-up, fold a paper circle in half, then in thirds. Snip little shapes along the edges and unfold.

WHY? Snow crystals have six sides or six arms because of the way water molecules join up when they freeze.

Teamwork **KINDNESS MISSION**

Make snowflakes together and hang them where everyone can see them.

From the book: Self-Filling Balloon

DEC 15

DAY 15 OF 24

Heavy or Light?



TINY WONDER

Look at an orange and a soft toy of the same size. Which is heavier? Guess honestly, then hold one in each hand.

WHY? Two things can be the same size but not the same weight. How heavy something is for its size is called density.

Honesty **KINDNESS MISSION**

Tell the truth today, even when it's hard.

From the book: Melting Race

DEC 16

DAY 16 OF 24

Rainbow in a Glass



TINY WONDER

Put a glass of water on a sunny windowsill, or shine a flashlight through it in a dark room. Look for a rainbow on white paper!

WHY? Water bends light, and each color bends a little differently, so white light spreads into a rainbow.

Learning from Mistakes **KINDNESS MISSION**

No rainbow? Move the glass and try again. That's how scientists work!

From the book: Liquid Tower

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Advent Cards 17–20

✂ Cut along the dashed lines

DEC 17

DAY 17 OF 24

The Ice Rescue



TINY WONDER

Freeze a small plastic toy in a little water in a cup. Tomorrow, set it free with warm hands, warm breath, and a little warm water.

WHY? Your warm hands and the warm water give heat to the ice, so it melts away.

Forgiveness **KINDNESS MISSION**

When someone says sorry today, forgive them. Warm words melt icy feelings!

From the book: Pink Snow Cloud

DEC 18

DAY 18 OF 24

Eyes in the Dark



TINY WONDER

Sit in a dark room for two minutes. What can you see at first? What can you see after two minutes?

WHY? Your pupils, the black circles in your eyes, open wider in a few seconds. Then, over the next minutes, your eyes slowly get better at seeing in the dark.

Courage **KINDNESS MISSION**

Do one brave thing today, like trying a new food or saying hello first.

From the book: Unpoppable Balloon

DEC 19

DAY 19 OF 24

The Cup Telephone



TINY WONDER

A grown-up pokes a hole in the bottom of two paper cups. Thread a long string through and knot each end. Pull it tight and talk!

WHY? Your voice makes the cup and string shake (vibrate). The shaking travels along the string to the other cup.

Helpfulness **KINDNESS MISSION**

Call someone on your cup phone and ask, "How can I help you today?"

From the book: Bubble Snake

DEC 20

DAY 20 OF 24

The Listening Minute



TINY WONDER

Close your eyes for one minute and count all the sounds you hear. Where does each one come from?

WHY? You have an ear on each side of your head, so your brain can tell where a sound comes from.

Empathy **KINDNESS MISSION**

Make a card for someone who might feel lonely this Christmas.

From the book: Cabbage Flowers

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Advent Cards 21–24

✂ Cut along the dashed lines

DEC 21 — DAY 21 OF 24 — Lunchtime Shadows



TINY WONDER

At lunchtime, ask a grown-up to measure your shadow with a string. Keep the string and measure again in June!

WHY? Earth is tilted. In December, the northern half leans away from the Sun, so days are short, the Sun stays low, and shadows are long. In the southern half, it's the opposite!

Acceptance KINDNESS MISSION

Tell someone, "I like you just the way you are."

From the book: Fizzy Lemons

DEC 22 — DAY 22 OF 24 — Color Mixing Magic



TINY WONDER

Mix a little yellow and blue paint, or a drop of each food coloring in water. Guess first: what color will you get?

WHY? Each one soaks up some colors of light. Together they soak up almost everything except green, so green reaches your eyes.

Learning from Mistakes KINDNESS MISSION

If a drawing goes wrong, turn the mistake into something new.

From the book: Marbled Swirls

DEC 23 — DAY 23 OF 24 — The Spinning Top



TINY WONDER

A grown-up pushes a short pencil through the middle of a paper plate, close to the point. Spin it on the table like a top!

WHY? Spinning helps it stay upright. When it slows down, it starts to wobble and falls over.

Helpfulness KINDNESS MISSION

Help wrap presents or tidy a room with someone in your family.

From the book: Balloon Fountain

DEC 24 — DAY 24 OF 24 — Christmas Eve Starlight



TINY WONDER

After dark, look at the stars through a paper-towel (kitchen-roll) tube. Cloudy? Look at the Christmas lights instead.

WHY? Starlight travels for years and years to reach us. Some of the starlight you see left its star before you were born!

Gratitude KINDNESS MISSION

At dinner, everyone says one thing they are thankful for this year.

From the book: Golden Snowfall

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WEEKEND LAB 1 OF 4 · TESTED BY JANKA

Walking-Water Advent Wreath



Janka's real photo: a row of four glasses in four colors works too.

AGES 3+ | WITH A GROWN-UP | NO FLAMES

GUESS FIRST

Can water climb up a paper towel? How far will it go?

YOU NEED

- 6 matching clear glasses or plastic cups
- Water
- Pink (or red) and blue food coloring
- Paper towels (kitchen roll), toilet paper, or tissues
- Tray

SCIENCE WORDS

capillary action: a liquid creeping through tiny gaps or tubes by itself

fiber: a very thin thread, like the ones paper is made of

STEPS

1. Set the 6 glasses in a ring on the tray, like an Advent wreath. Fill each almost to the top with water.
2. Add food coloring to the glasses, alternating pink and blue. Careful, food coloring stains!
3. Fold 6 paper towel sheets lengthwise into narrow strips. Use each strip to link 2 neighboring glasses, with one end dipping into each glass.
4. Watch the colored water creep up the paper! In the middle of each strip, the colors meet and turn purple.
5. Tip: Try it again with every other glass empty. In a few hours, the colored water will walk into them!

WHY? Paper towels are made of thin cellulose fibers with lots of tiny gaps between them. Water sticks to the fibers, and surface tension pulls it up through these narrow gaps, even against gravity. This is called capillary action. It's also how a sponge soaks up a spill. In the middle of the strips, the two colors meet and mix: pink and blue make purple.

Generosity KINDNESS MISSION

This week, share something with a friend: a tangerine, your play dough, or your colored pencils!

Tip: The glasses share their colors too. Watch the pink and blue water walk across the paper!

SAFETY AND CLEANUP

Food coloring stains, so work on the tray. Clear plastic cups are best for little hands. Keep the tray away from phones and plugs. When you're done, pour the water down the sink and put the paper towels in the trash.

This is Adventure 41 in *Theo & Tilda's Christmas Science Adventure*, where it has its own story.

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WEEKEND LAB 2 OF 4 · TESTED BY JANKA

Upside-Down Water Glass



Janka's real photo: the card holds the water in.

AGES 5+ | WITH A GROWN-UP | NO FLAMES

GUESS FIRST

Cover a full glass with a card and turn it upside down. Will the water pour out?

YOU NEED

- 1 narrow glass or sturdy plastic cup (not a soft one)
- Water
- 1 flat card, like a postcard or half a Christmas card (wider than the glass)
- Sink or a large bowl

SCIENCE WORDS

air pressure: how hard the air pushes on everything around it
gravity: the pull that makes things fall down to the ground
seal: a tight fit that lets no air or water through

STEPS

1. Do this over the sink or a large bowl. Fill the glass with water right to the top.
2. Put the card on the glass and press it down evenly with your palm, so there are no gaps anywhere.
3. Hold the glass with one hand, and keep your other palm pressed on the card. Turn the glass upside down, hold it straight, then slowly take your hand off the card.
4. The card stays put and the water doesn't pour out! But in time the card gets soggy and bends, and the water spills. So stay over the sink or bowl the whole time!

WHY? Gravity hasn't vanished: it still pulls the water down. But the air below pushes the card up, and that push is much stronger than the water's weight. If the card sags even a hair, the pressure in the glass drops below the pressure outside, so the outside air pushes the card back. Surface tension helps the wet rim seal well, so no air gets into the glass. When the card gets soggy, air bubbles in and the water spills.

Empathy KINDNESS MISSION

If someone around you is sad or grumpy this week, kindly ask them, "What happened?"

Tip: If someone spills the water the first time, don't laugh. Show them how you did it!

SAFETY AND CLEANUP

Stay over the sink or bowl the whole time, and wipe up drips. A sturdy plastic cup is best for little hands, but don't squeeze it. When you're done, pour out the water and put the soggy card in the trash.

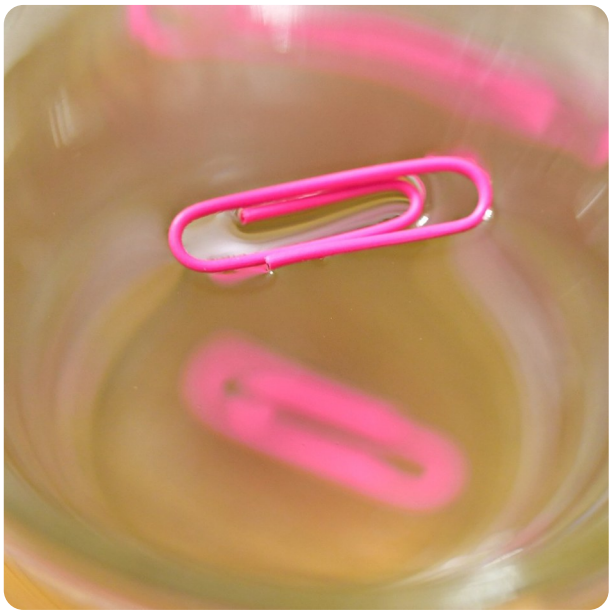
This is Adventure 23 in *Theo & Tilda's Christmas Science Adventure*, where it has its own story.

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WEEKEND LAB 3 OF 4 · TESTED BY JANKA

Paper Clip on Water's Skin



Janka's real photo: one paper clip floats on the water's skin, and the dropped one sank.

AGES 5+ | WITH A GROWN-UP | NO FLAMES

GUESS FIRST

Will a metal paper clip float on water?

YOU NEED

- 1 glass of water
- 2 metal paper clips (colored ones work too)
- 1 small piece of thin paper, like a tissue
- 1 drop of dish soap (washing-up liquid), optional

SCIENCE WORDS

surface tension: how a liquid's surface acts like a thin, stretchy skin

molecule: a tiny bit of a substance, too small to see

surface: the very top or outside layer of something

STEPS

1. Fill the glass with water. Drop in one clip: it sinks right to the bottom.
2. Tear off a piece of tissue just big enough for a paper clip, and lay the other, dry clip on it.
3. Very gently lay the tissue and clip together on the water's surface.
4. Wait for the tissue to soak through and sink. If it doesn't, gently poke its edges down with a pencil, without touching the clip. The clip stays on top of the water!
5. Bonus: add a drop of dish soap at the edge of the glass, and watch what happens to the paper clip!

WHY? Water molecules pull hard on each other. The ones at the surface are pulled sideways and inward by their neighbors, so the surface acts like a stretched, springy skin: this is surface tension. A paper clip is denser than water, so it should sink. But laid down gently, it only makes a small dip in the skin, and the skin holds it up like a trampoline. If you drop it in, it breaks through. Dish soap weakens the skin, so then the paper clip sinks.

Learning from Mistakes KINDNESS MISSION

If something goes wrong this week, say, "I got that wrong, but now I know what to do differently next time!"

Tip: If the paper clip sinks, think about what you did, and try again even more slowly!

SAFETY AND CLEANUP

Paper clips are small, so keep them away from children under 3. Don't drink the soapy water. When you're done, put the tissue in the trash, pour the water away, and dry the paper clips.

This is Adventure 16 in *Theo & Tilda's Christmas Science Adventure*, where it has its own story.

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WEEKEND LAB 4 OF 4 · TESTED BY JANKA

Salt Snow and Oil Bubbles



Janka's real photo: salt pulls oil down, and oil drops float back up.

AGES 5+ | WITH A GROWN-UP | NO FLAMES

GUESS FIRST

What will happen when salt "snows" into the oil?

YOU NEED

- 1 tall clear glass (or a clear bottle)
- 100 mL (a scant ½ cup) cooking oil
- Water
- Salt (1–2 tsp, or more for a longer show)
- Blue or turquoise food coloring (optional)
- Tray

SCIENCE WORDS

density: how heavy something is for its size

dissolve: to break up and spread out completely in a liquid

STEPS

1. Pour the oil into the glass.
2. If you like, tint the water with a few drops of blue or turquoise food coloring. Pour it onto the oil, leaving a little room at the top of the glass.
3. Wait a moment, and watch the oil float up on top of the water.
4. Sprinkle in a teaspoon of salt, like falling snow!
5. Watch the salt sink, then see oil bubbles slowly rise from the bottom, one by one! Add more salt to keep the show going.

WHY? Oil is less dense than water: the same amount weighs less, so it floats on top. As the salt grains pass through the oil layer, they drag some oil along, and it sinks to the bottom with the salt. Down there, the salt slowly dissolves and lets go of the oil, which floats back up. So the rising "bubbles" are oil drops, not air bubbles.

Cooperation **KINDNESS MISSION**

This week, if you and a sibling or friend want to play different things, make up a game together!

Tip: One of you sprinkles the salt, and the other watches the bubbles. Then switch!

SAFETY AND CLEANUP

Oil and food coloring stain, so work on a tray. Oil makes floors slippery, so wipe up spills right away. This glass is for watching, not for drinking! When you're done, pour the oil into a jar with a lid for the trash, not down the drain, and pour the salty water down the sink.

This is Adventure 30 in *Theo & Tilda's Christmas Science Adventure*, where it has its own story.

FREE to share

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Advent Memory Game

✂ Cut along the dashed lines

1. A grown-up cuts out the 24 cards. Mix them up and lay them face down.
2. The youngest player goes first. Take turns flipping over two cards.
3. Found a pair? Keep it, tell everyone that day's tiny wonder, and go again. No pair? Flip them back face down.
4. When all the cards are gone, the player with the most pairs wins.

Print this page on light cardstock (thin card) so the pictures don't show through.

DAY 1

Fog Drawings

DAY 2

The Ice Cube Watch

DAY 3

Reindeer Heartbeat

DAY 6

Sprout Watch

DAY 8

Bouncing Light

DAY 9

The Magnet Hunt

DAY 11

Shadow Puppets

DAY 14

Six-Armed Snowflakes

DAY 17

The Ice Rescue

DAY 19

The Cup Telephone

DAY 23

The Spinning Top

DAY 24

Christmas Eve Starlight

DAY 1

Fog Drawings

DAY 2

The Ice Cube Watch

DAY 3

Reindeer Heartbeat

DAY 6

Sprout Watch

DAY 8

Bouncing Light

DAY 9

The Magnet Hunt

DAY 11

Shadow Puppets

DAY 14

Six-Armed Snowflakes

DAY 17

The Ice Rescue

DAY 19

The Cup Telephone

DAY 23

The Spinning Top

DAY 24

Christmas Eve Starlight

FREE to share

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Winter Science Bingo

Play on a walk, at home, or in the car. When you spot something on your card, color its square. Four in a row is BINGO! Across, down, or corner to corner all count. Then pick a square and wonder why together. More players? Print this page again.

CARD A

PLAYER: _____

 Your breath makes a little cloud	 Frost on a window or on the grass	 Your own shadow	 Something that floats
 A magnet holding something	 Your face in a shiny ornament	 A little rainbow of light	 Ice or snow melting
 A bell ringing	 The first bright light in the evening sky	 The Moon, by day or by night	 A seed or a sprout
 Static hair after your hat comes off	 A snowflake, real or paper	 Something spinning	 A warm spot and a cool spot at home

CARD B

PLAYER: _____

 Fog on a mirror after a bath	 A magnet holding something	 The first bright light in the evening sky	 Your own shadow
 Something spinning	 Something that sparkles	 A little rainbow of light	 A seed or a sprout
 Something that floats	 A snowflake, real or paper	 Your face in a shiny ornament	 A warm spot and a cool spot at home
 A bell ringing	 Static hair after your hat comes off	 The Moon, by day or by night	 Ice or snow melting

Somewhere warm this December? Swap any square for something that surprises you. Never look straight at the Sun, and never touch stoves, heaters, or fireplaces.

FREE to share

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Race to Christmas Eve

A board game for 2–4 players. You need one die, plus a button or a coin for each player. Keep buttons, coins, and dice away from children under 3. The rules and the Wonder Cards are on page 19.



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Rules and Wonder Cards

✂ Cut along the dashed lines



HOW TO PLAY RACE TO CHRISTMAS EVE

1. Shuffle the Wonder Cards and stack them face down. Everyone puts a button or a coin on START. The youngest player goes first, then take turns.
2. Roll the die and move that many squares, following the arrows.
3. Land at the foot of a silver ladder? Climb up! Land at the top of an icy slide? Whoosh, slide down!
4. Land on a question mark? Someone reads you the top Wonder Card. Answer it or make your best guess, listen to the answer, then move one square ahead. Put the card at the bottom of the pile.
5. The first player to reach Christmas Eve (square 24) wins. You don't need an exact roll.

? WONDER CARD

Why does a cold window fog up when you breathe on it?

Answer: Warm breath carries invisible water vapor. On the cold glass it turns into tiny droplets.

? WONDER CARD

Why does your heart beat faster when you jump?

Answer: Busy muscles need more oxygen, so your heart beats faster to bring it to them.

? WONDER CARD

Does anyone else in the world have your fingerprints?

Answer: No! Nobody has ever found two people with the same fingerprints, not even twins.

? WONDER CARD

How can you make a paper bridge hold more crayons?

Answer: Fold it like a fan. The folds make the paper stiff.

? WONDER CARD

What wakes up a dried lentil so it sprouts?

Answer: Water. In a few days, a tiny root pokes out to drink.

? WONDER CARD

What does a mirror do to light?

Answer: It bounces the light off in a new direction. This is called reflection.

? WONDER CARD

Name one thing a magnet sticks to and one it doesn't.

Answer: It sticks to iron and most steel, but not to wood, plastic, paper, or aluminum foil.

? WONDER CARD

Why does a tower with a wide bottom stand better?

Answer: A wide, steady base keeps a tower from tipping over.

? WONDER CARD

How many arms does a snowflake have?

Answer: Six! Snow crystals have six sides or six arms.

? WONDER CARD

Why does your hand make a shadow on the wall?

Answer: Your hand blocks the light, so a dark shape appears behind it.

? WONDER CARD

How does your voice travel along a cup telephone?

Answer: It makes the cup and string shake (vibrate), and the shaking travels to the other cup.

? WONDER CARD

Why does a spinning top fall over in the end?

Answer: Spinning helps it stay upright. Rubbing on the table and the air slow it down, and then it wobbles and falls.

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My Favorite Advent Day

Draw your favorite tiny wonder, and write down the kindest thing you did this December.

My favorite tiny wonder was Day _____



THE KINDEST THING I DID THIS DECEMBER

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THIS CERTIFICATE IS PROUDLY PRESENTED TO



Advent Wonder Explorer



for 24 days of wonder, kindness, and curiosity. Theo and Tilda are very proud of you!



PRESENTED BY

Janka

Janka Sára Molnár,
physicist
with Theo and Tilda

Date

Signed by a grown-up

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About Janka



Cold fog by the lake

Meet Janka

Janka Sára Molnár is a physicist and award-winning science communicator from Hungary, and the founder of FUNtastic Christmas Science. Her mission is to show children and grown-ups that science is lovable, understandable, and part of everyday life.

As a high school student, she spent years building multiwire proportional chambers, a kind of particle detector, and took them to CERN several times, where she also presented them in the CERN teacher program. After high school, she graduated from Eötvös Loránd University (ELTE) in Budapest. Since then, she has run several hundred science shows for children and families in Hungary, from big, smoky stage experiments to tiny kitchen ones.

HER AWARDS

- **Role Model Award, Innovation**
  Nők Lapja, 2026
- **Women of Excellence Award**
  Science communication, Szakmai Elit, 2026
- **Rising Star Award**
  Creator Awards, 2024
- **Winner of A Híd (The Bridge)**
  HBO Max reality series, 2023
- **Juhari Zsuzsanna Blog of the Year Award**
  Hungarian Academy of Sciences, 2023
- **FORBES NEXT: 30 talented young people under 30 from the world of science – 2018**



Share the Wonder

Know a family or a teacher who would love this? Pass the calendar on so more children get to know Theo and Tilda.

Want More Christmas Science?

Theo & Tilda's Christmas Science Adventure has 51 stories, 51 hands-on experiments with real photos, and a 24-day December plan. Try the first five days free at christmas-science.com.

Scan for the free sampler

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