

Kidney Explorers Activity Packs

Teacher Kit

Five standalone kidney health enrichment activities for grades K–5

Organized by grade band -K-1, 2-3, and 4-5 sections

Each activity stands alone • Use one, a few, or all five • Any order

Hands-on activities • Printable worksheets • Badges & certificate • Free for schools

What's Inside This Kit

- Five standalone activity packs organized by grade band (K-1, 2-3, 4-5)
- Each band has all 5 activities -just flip to your section
- Printable Kidney Explorer Packet pages, badges & certificate
- Hydration Hero Tracker worksheet
- Materials checklists & standards connections

Nephraware.org

Empowering Kidney Health Awareness

Questions or feedback? Email us at nephraware@gmail.com

Educational Use Notice: These activities are for general health education enrichment in schools and community settings.

It is not medical advice, diagnosis, or treatment. If a child has symptoms or health concerns, contact a parent/guardian, school nurse, or healthcare professional.

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- All 5 activity packs for 4th – 5th Grade
- Standards Connections (NGSS & SEL)
- Materials Checklist

PRINTABLES:

- Kidney Explorer Packet Pages (5 pages)
- Badges (cut-out sheet)
- Hydration Hero Tracker
- Certified Kidney Explorer Certificate

■ **Teacher tip:** Find your grade band and pick any activity that fits your schedule. Each one stands alone -no need to do them all or in order.



Overview

Kidney Explorers is a set of five free, standalone enrichment activities for elementary students (grades K–5) covering kidney function, hydration, nutrition, and empathy through hands-on, age-appropriate learning.

Each activity is designed to work on its own in a single class period -no multi-session commitment required. This kit is organized **by grade band**. Find your section (K-1, 2-3, or 4-5), pick any activity that fits your schedule, and go. We suggest starting with "Kidneys 101" if students are new to the topic, but any order works.

ACTIVITIES	5 standalone packs -use any or all, in any order
CLASS TIME	45–50 minutes per activity
GRADES	K–5, organized in three grade-band sections
STANDARDS	Designed to support NGSS and SEL learning goals
COST	Free -all materials are common classroom supplies
SETTING	Classroom enrichment, after-school, science clubs, or summer programs

How to Use This Kit

1. Find your grade band section (K-1, 2-3, or 4-5).
2. Pick any activity pack that fits your schedule or topic needs.
3. Gather materials using the checklists at the back of this kit.
4. Print any Kidney Explorer Packet pages or worksheets you want to use.
5. Send take-home connections to involve families.
6. Award badges for each activity -or a Certified Kidney Explorer certificate for completing any!

Teacher Notes: Safety and Privacy

- These activities are for general education enrichment only and should not be used to diagnose or assess student health.
- Do not ask students to share personal medical conditions, medications, bathroom habits, or family health history.
- Allow students to participate privately in reflection activities.
- Adjust activities as needed for student age, maturity, and school policy.
- For any health concerns raised by a student, refer them to a parent/guardian, school nurse, or healthcare professional.

Intended for teacher-led classroom use. Not intended for unsupervised medical self-assessment by children.



GRADES K-1

Kindergarten – 1st Grade

All 5 Activity Packs for This Grade Band

K-1

This section contains all 5 activity packs for **Grades K-1** (Kindergarten – 1st Grade). Each activity includes an opening hook, learning objectives, hands-on activities, a take-home connection, and an assessment.

- **Kidneys 101:** Meet the Kidney Crew!
- **Filtration:** The Super Filter Factory
- **Hydration:** The Water Balance Game
- **Nutrition:** Kidney-Friendly Fuel
- **Empathy:** When Kidneys Need Help



Meet the Kidney Crew!

What kidneys are & where they live

M1

GRADES K-1 | Kindergarten – 1st Grade

“ Raise your hand if you drank water today! Where does that water GO? Hold up a stuffed animal and point to the lower back -Your kidneys live right **HERE!**

LEARNING OBJECTIVES

1. Point to where kidneys are on the body
2. Say that kidneys are shaped like beans
3. Tell a friend one thing kidneys do

ACTIVITIES

Felt Body Outline

Hands-on

25 min

Lay out a large felt body outline. Give each child two bean-shaped felt cutouts. They place the kidneys where they belong, then glue them on. Add googly eyes to make them friendly!

Kidney Bean Show & Tell

Sensory

10 min

Pass around real kidney beans. Feel how smooth they are. Your kidneys are shaped just like this! Each child holds one up to their fist for size comparison.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Kidneys 101 page: color the kidney picture and write your name as a Kidney Explorer. Show your family where kidneys are!

ASSESSMENT

Stand-up check: Everyone point to where your kidneys are! Then tell a partner one thing kidneys do.

TEACHER NOTE

Comparisons in this lesson are simplified models to help students understand kidney location and basic function.

MATERIALS NEEDED

- Butcher paper or felt body outline
- Kidney bean-shaped cutouts (felt or paper)
- Glue sticks & googly eyes



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- Markers/crayons & rulers
 - Real kidney beans (dried)
 - Body diagram worksheets
 - Kidney Fact Sheet printable
 - Kidney Explorer Packets (printable provided)



The Super Filter Factory

How kidneys clean your blood

M2

GRADES K-1 | Kindergarten – 1st Grade

“ Pour muddy water into a clear glass. Ewww! Would you drink THIS? Watch what happens... Pour through a coffee filter. WOW! Your kidneys help remove waste and keep important substances in balance all day long!

LEARNING OBJECTIVES

1. Watch dirty water become cleaner through a filter
2. Say that kidneys clean blood like a filter cleans water
3. Use the word filter

ACTIVITIES

Magic Filter Demo

Science Demo

15 min

Teacher demonstrates: pour muddy water through a coffee filter into a clear cup. Students watch from a circle. Let each child feel the dirty filter afterward.

Sort the Blood!

Active Game

20 min

Scatter red pom-poms (good blood), blue pom-poms (vitamins), and crumpled black paper (waste). Students are kidneys -60 seconds to pick up ONLY the waste!

My Filter Drawing

Art

10 min

Draw a kidney with dirty blood going in and clean blood coming out. Use red for clean and brown for dirty. Add a smiley face!

TAKE-HOME CONNECTION

Kidney Explorer Packet, Filtration: Glue a small piece of coffee filter. Draw dirty blood in, clean blood out. Tell family: My kidneys are filters!

ASSESSMENT

Partner talk: What does a filter do? What organ in your body helps filter waste from the blood?

TEACHER NOTE

The muddy-water activity is a simplified demonstration. Real kidneys work through complex biological processes and do not function exactly like classroom filters.



MATERIALS NEEDED

- Soil/dirt & water pitchers
- Clear cups (2 per group)
- Coffee filters & funnels
- Red & blue pom-poms
- Black paper (for crumpling)
- 2 bins per group (KEEP / REMOVE)
- Drawing paper & markers
- Gravel, sand, cotton balls (4-5)
- Nephron reference sheets (4-5)



The Water Balance Game

Why hydration and kidneys are best friends

M3

GRADES K-1 | Kindergarten – 1st Grade

“ Show two plants -one well-watered, one wilting. Look at this sad plant! It didn't get enough water. Water helps your body, including your kidneys, do their job.

LEARNING OBJECTIVES

1. Say why drinking water is good for kidneys
2. Show what too much and just right means
3. Name one healthy hydration habit

ACTIVITIES

Cup Pouring Game

Sensory / Math

15 min

Give each child 3 cups marked with a line. Pour water: too full (overflow!), too empty (needs more!), just right (happy kidney!). Your kidneys help balance the water in your body!

Water Song & Dance

Music / Movement

10 min

Drink your water, every day, help your kidneys work and play, not too much and not too few, water is the best for you! Dance and repeat!

TAKE-HOME CONNECTION

Kidney Explorer Packet, Hydration page: Draw yourself drinking water. Family challenge: talk about healthy drink choices at home!

ASSESSMENT

Thumbs up/down: Drinking soda is great for kidneys (down!). Drinking water helps kidneys (up!).

TEACHER NOTE

Activities in this lesson are for general education only and should not be used to assess a child's health.

MATERIALS NEEDED

- Clear cups (3 per child for K-1)
- Water pitchers & buckets (2)



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- Scoops/ladles
 - Water tracker template (printable)
 - Plants (1 healthy, 1 wilting)
 - Raindrop stickers (2-3)
 - Calculator (4-5)



Kidney-Friendly Fuel

Foods that help your kidneys

M4

GRADES K-1 | Kindergarten – 1st Grade

“ Hold up a banana and a bag of chips. Which one may be a healthier choice for your body? Let's find out!

LEARNING OBJECTIVES

1. Sort foods into kidney-friendly and less kidney-friendly groups
2. Say that too much salt is hard on kidneys
3. Name one healthy snack good for kidneys

ACTIVITIES

Food Sorting Game

Hands-on

20 min

Food picture cards sorted into Kidney-Friendly! and Less Kidney-Friendly! bins. Review together -some are tricky! A little bit of anything is okay, but too much salt or sugar makes kidneys work harder.

Salty vs. Plain Water

Science Demo

10 min

Two cups: plain vs. salty water. Pour each through a coffee filter. Too much sodium over time can make it harder for the body to maintain healthy balance.

Healthy Snack Drawing

Art

15 min

Draw a favorite kidney-friendly snack on a paper plate. Write My kidneys love ____! Hang on class display.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Nutrition: Draw 3 kidney-friendly foods. Circle one you'll try. Ask a grown-up about kidney-friendly foods!

ASSESSMENT

Thumbs up/down: Teacher holds up food pictures. Kidney-friendly or less kidney-friendly?

TEACHER NOTE

Food activities are simplified and should not label foods as completely good or bad. Encourage balanced eating and follow school nutrition guidance.



MATERIALS NEEDED

- Food picture cards (K-1)
- Empty food packages (various)
- Nutrition labels
- Green/Yellow/Red sorting cards
- Food magazines, glue, scissors
- Poster board & paper plates
- Salt, water bottles, coffee filters



When Kidneys Need Help

Kidney disease, empathy, and how we support friends

M5

GRADES K-1 | Kindergarten – 1st Grade

“*Bring out a stuffed animal with a bandage. Oh no -Kiddo the Bear's kidneys aren't feeling well. Kiddo's kidneys need extra help from doctors. But we can help Kiddo feel better!*

LEARNING OBJECTIVES

1. Understand that some kids' kidneys need extra help
2. Practice saying kind and supportive things
3. Name one way to be a good friend to someone who is sick

ACTIVITIES

Helping Kiddo

Imaginative Play

15 min

Pass Kiddo around the circle. Each child says one nice thing: I hope you feel better! I'll sit with you at lunch! Teacher models first.

Kindness Cards

SEL / Art

20 min

Make cards for someone who might be sick. Draw hearts, rainbows, and kidneys with smiley faces. Cards may be displayed in class or shared with an organization only if arranged in advance by the teacher or school.

Our Promise Circle

Discussion

10 min

If a friend couldn't run at recess, what could we do? Brainstorm kind ideas. Write on poster: Our Kidney Crew Promise. Everyone signs.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Empathy: Draw one way to be a kidney hero. Show family the card you made. Complete the packet -Certified Kidney Explorer!

ASSESSMENT

Circle share: One thing learned about kidneys AND one way to be kind to someone whose kidneys need help.



TEACHER NOTE

Present kidney disease in a calm, age-appropriate way. Avoid asking students to share personal diagnoses or family medical information.

MATERIALS NEEDED

- Coffee filters, clay, dirty water (from Filtration activity)
- Stuffed animal with bandage (K-1)
- Card stock or construction paper
- Markers, stickers, glitter glue
- Kidney mascot templates (printable)
- Poster paper for class promise
- Certified Kidney Explorer certificates
- Student profiles (anonymized, 4-5)
- Short story about child with kidney disease (2-3)



GRADES 2-3

2nd – 3rd Grade

All 5 Activity Packs for This Grade Band

2-3

This section contains all 5 activity packs for **Grades 2-3** (2nd – 3rd Grade). Each activity includes an opening hook, learning objectives, hands-on activities, a take-home connection, and an assessment.

- **Kidneys 101:** Meet the Kidney Crew!
- **Filtration:** The Super Filter Factory
- **Hydration:** The Water Balance Game
- **Nutrition:** Kidney-Friendly Fuel
- **Empathy:** When Kidneys Need Help



Meet the Kidney Crew!

What kidneys are & where they live

M1

GRADES 2-3 | 2nd – 3rd Grade

“ Raise your hand if you drank water today! Where does that water GO? Trace the path: mouth → stomach → blood → kidneys → bladder. Your kidneys are the cleanup crew!

LEARNING OBJECTIVES

1. Locate kidneys on a labeled body diagram
2. Describe kidneys as the body's cleaning machines
3. Write one interesting kidney fact

ACTIVITIES

Body Diagram Lab

Science

20 min

Each student gets a body diagram worksheet. Color-code organs: kidneys in red, bladder in yellow, heart in pink. Label each organ and draw arrows showing blood flow.

Fun Fact Research

Reading / Writing

15 min

Give pairs a Kidney Fact Sheet with 8 fun facts. Each pair picks their favorite, writes it on a card, and illustrates it. Create a class Kidney Fact Wall.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Kidneys 101: Label and color the kidney diagram. Write your favorite kidney fun fact. Quiz a family member!

ASSESSMENT

Written exit ticket: Draw where kidneys are on a body outline and write one sentence about what they do.

TEACHER NOTE

Comparisons in this lesson are simplified models to help students understand kidney location and basic function.

MATERIALS NEEDED

- Butcher paper or felt body outline
- Kidney bean-shaped cutouts (felt or paper)



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- Glue sticks & googly eyes
 - Markers/crayons & rulers
 - Real kidney beans (dried)
 - Body diagram worksheets
 - Kidney Fact Sheet printable
 - Kidney Explorer Packets (printable provided)



The Super Filter Factory

How kidneys clean your blood

M2

GRADES 2-3 | 2nd – 3rd Grade

“ Pour muddy water into a clear glass. Would you drink THIS? Your blood picks up waste too -but you have two amazing filters built right inside you!

LEARNING OBJECTIVES

1. Explain filtration using their own words
2. Demonstrate how kidneys separate useful things from waste
3. Use filter correctly in a sentence

ACTIVITIES

Dirty Water Lab

Science Experiment

25 min

In groups: pour muddy water through coffee filters. Draw before and after pictures. Record observations. Write: My kidneys filter ____ liters of blood every day.

Sort the Blood!

Active Game

15 min

Sort red pom-poms (blood cells), blue pom-poms (nutrients), and crumpled black paper (waste) into KEEP and REMOVE bins. Compare team accuracy!

Filter Factory Blueprint

Art / Writing

15 min

Draw a kidney filter factory. Label: entrance (blood in), sorting room, clean exit, waste chute (to bladder). Be creative with workers and conveyor belts!

TAKE-HOME CONNECTION

Kidney Explorer Packet, Filtration: Glue in a coffee filter piece. Write before/after observations. Write a sentence using filter.

ASSESSMENT

Draw-and-explain: Show how a kidney cleans blood using pictures and at least 2 labels.

TEACHER NOTE

The muddy-water activity is a simplified demonstration. Real kidneys work through complex biological processes and do not function exactly like classroom filters.

MATERIALS NEEDED



-
- Soil/dirt & water pitchers
 - Clear cups (2 per group)
 - Coffee filters & funnels
 - Red & blue pom-poms
 - Black paper (for crumpling)
 - 2 bins per group (KEEP / REMOVE)
 - Drawing paper & markers
 - Gravel, sand, cotton balls (4-5)
 - Nephron reference sheets (4-5)



The Water Balance Game

Why hydration and kidneys are best friends

M3

GRADES 2-3 | 2nd – 3rd Grade

“ Show two plants. Your kidneys are like gardeners -they decide exactly how much water your body keeps and how much it lets go.

LEARNING OBJECTIVES

1. Explain why water is important for kidneys
2. Describe what happens with too little or too much water
3. Track water intake and set a goal

ACTIVITIES

The Balancing Act

Movement Game

15 min

Two teams with buckets. Teacher pours water in. Teams scoop OUT the right amount to keep at the marked line. Too high = overhydrated! Too low = dehydrated!

Class Water Tracker

Math / Data

20 min

Track class water intake for a day using a pictograph. Each cup = one raindrop sticker. Did we reach our goal?

TAKE-HOME CONNECTION

Kidney Explorer Packet, Hydration page: Set a daily water goal. Family challenge: everyone tracks water for 3 days!

ASSESSMENT

Think-pair-share: Tell your partner why water is important for kidneys AND what kidneys do with extra water.

TEACHER NOTE

Activities in this lesson are for general education only and should not be used to assess a child's health.

MATERIALS NEEDED

- Clear cups (3 per child for K-1)
- Water pitchers & buckets (2)
- Scoops/ladles



-
- Water tracker template (printable)
 - Plants (1 healthy, 1 wilting)
 - Raindrop stickers (2-3)
 - Calculator (4-5)



Kidney-Friendly Fuel

Foods that help your kidneys

M4

GRADES 2-3 | 2nd – 3rd Grade

“ Two identical water bottles. Add 1 tsp salt to one. Tiny sip test! Which choice may be healthier for your body overall?

LEARNING OBJECTIVES

1. Identify 3 kidney-friendly foods and explain why
2. Read a nutrition label for sodium content
3. Create a kidney-friendly meal plan

ACTIVITIES

Grocery Store Detectives

Critical Thinking

20 min

Hunt for sodium on nutrition labels. Sort into GREEN (low sodium), YELLOW (moderate), RED (high). Make a class display.

Chef Kidney's Kitchen

Creative / Nutrition

20 min

Design a one-day kidney-friendly menu using food magazine cutouts. Present and explain WHY each food is kidney-smart.

Salt Shake Experiment

Science Demo

10 min

Filter salty water vs. plain water. Which takes longer? Too much sodium over time can make it harder for the body to maintain healthy balance.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Nutrition: My Kidney-Friendly Snack Pledge -3 kidney-smart snacks to try. Check sodium on one item at home.

ASSESSMENT

Quiz game: Teacher holds up food items. Thumbs up or down. Discuss tricky ones.

TEACHER NOTE

Food activities are simplified and should not label foods as completely good or bad. Encourage balanced eating and follow school nutrition guidance.

MATERIALS NEEDED



-
- Food picture cards (K-1)
 - Empty food packages (various)
 - Nutrition labels
 - Green/Yellow/Red sorting cards
 - Food magazines, glue, scissors
 - Poster board & paper plates
 - Salt, water bottles, coffee filters



When Kidneys Need Help

Kidney disease, empathy, and how we support friends

M5

GRADES 2-3 | 2nd – 3rd Grade

“Imagine a filter factory -kidneys clean your blood kind of like that. Now imagine if some filters got clogged or broken. The factory doesn't stop -but it needs HELP.”

LEARNING OBJECTIVES

1. Understand that some children's kidneys don't work perfectly
2. Name one way doctors help kidneys that need support
3. Write a supportive message

ACTIVITIES

Clogged Filter Demo

Science + Empathy

15 min

Repeat filtration but block the filter with clay. Water drips slower -some waste gets through. This model helps show that sometimes kidneys need extra medical help.

Kindness Cards

SEL / Art

20 min

Read a short story about a child with kidney treatments. Create encouragement cards with kidney mascots. Discuss: What would YOU want to hear?

Helper Heroes Circle

Discussion / SEL

15 min

If your friend had to go to the doctor a lot, how would you make them feel included? Brainstorm a class list. Make a poster.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Empathy: How I Can Be a Kidney Hero -write or draw one way to support someone. Complete the packet!

ASSESSMENT

Written reflection: One thing learned about kidneys AND one way to be kind to someone whose kidneys need help.

TEACHER NOTE

Present kidney disease in a calm, age-appropriate way. Avoid asking students to share personal diagnoses or family medical information.



MATERIALS NEEDED

- Coffee filters, clay, dirty water (from Filtration activity)
- Stuffed animal with bandage (K-1)
- Card stock or construction paper
- Markers, stickers, glitter glue
- Kidney mascot templates (printable)
- Poster paper for class promise
- Certified Kidney Explorer certificates
- Student profiles (anonymized, 4-5)
- Short story about child with kidney disease (2-3)



GRADES 4-5

4th – 5th Grade

All 5 Activity Packs for This Grade Band

4-5

This section contains all 5 activity packs for **Grades 4-5** (4th – 5th Grade). Each activity includes an opening hook, learning objectives, hands-on activities, a take-home connection, and an assessment.

- **Kidneys 101:** Meet the Kidney Crew!
- **Filtration:** The Super Filter Factory
- **Hydration:** The Water Balance Game
- **Nutrition:** Kidney-Friendly Fuel
- **Empathy:** When Kidneys Need Help



Meet the Kidney Crew!

What kidneys are & where they live

M1

GRADES 4-5 | 4th – 5th Grade

“Your kidneys process about 150 liters of fluid every single day. That's 75 two-liter soda bottles! Let's explore how.

LEARNING OBJECTIVES

1. Locate and describe the position of kidneys in the urinary system
2. Compare kidney size to familiar objects
3. Research and present one kidney fact from the animal kingdom

ACTIVITIES

Fist Measurement Lab

Math / Science

15 min

Measure fist length and width with rulers. Record in a class data table. Calculate class average. Create a bar graph of fist sizes.

Animal Kidney Research

Research

20 min

In pairs, research one animal's kidneys using fact cards. How do whale kidneys differ? Why do desert rats have super-efficient kidneys? Present findings in 1 minute.

Urinary System Diagram

Science / Art

15 min

Draw a detailed urinary system: kidneys, ureters, bladder, urethra. Label each part, write a one-sentence job description, and add flow arrows.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Kidneys 101: Complete the urinary system diagram. Write a Did You Know? kidney fact. Bonus: find the animal with the most efficient kidneys.

ASSESSMENT

Written response: Explain the location and basic function of kidneys in 3-4 sentences with at least one comparison.

TEACHER NOTE

Comparisons in this lesson are simplified models to help students understand kidney location and basic function.



MATERIALS NEEDED

- Butcher paper or felt body outline
- Kidney bean-shaped cutouts (felt or paper)
- Glue sticks & googly eyes
- Markers/crayons & rulers
- Real kidney beans (dried)
- Body diagram worksheets
- Kidney Fact Sheet printable
- Kidney Explorer Packets (printable provided)



The Super Filter Factory

How kidneys clean your blood

M2

GRADES 4-5 | 4th – 5th Grade

“ This water has soil, sand, and organic particles. Your blood carries waste like urea and excess salts. How do your kidneys remove the bad without losing the good?

LEARNING OBJECTIVES

1. Explain filtration using scientific vocabulary
2. Design and test a multi-stage filtration system
3. Compare filtration efficiency and write a hypothesis

ACTIVITIES

Multi-Stage Filtration Lab

Science Experiment

30 min

Build a 3-stage filter: gravel, sand, cotton balls. Pour dirty water through. Measure clarity (1-5 scale). Write hypothesis before, results after. Compare with single-filter results.

Nephron Diagram

Science / Research

15 min

Draw a simplified nephron. Label: glomerulus, tubule, collecting duct. Write what gets filtered vs. reabsorbed. You have about 1 million nephrons per kidney!

Filtration Data Analysis

Math

10 min

Record class results in a data table. Calculate average clarity for single vs. multi-stage. Create a bar graph. Discuss: Why does multi-stage work better?

TAKE-HOME CONNECTION

Kidney Explorer Packet, Filtration: Draw your multi-stage filter with labels. Record clarity data.
Research: What happens when kidneys can't filter properly?

ASSESSMENT

Written explanation: Describe filtration in 4-5 sentences using: filter, waste, reabsorb, nephron.

TEACHER NOTE

The muddy-water activity is a simplified demonstration. Real kidneys work through complex biological processes and do not function exactly like classroom filters.



MATERIALS NEEDED

- Soil/dirt & water pitchers
- Clear cups (2 per group)
- Coffee filters & funnels
- Red & blue pom-poms
- Black paper (for crumpling)
- 2 bins per group (KEEP / REMOVE)
- Drawing paper & markers
- Gravel, sand, cotton balls (4-5)
- Nephron reference sheets (4-5)



The Water Balance Game

Why hydration and kidneys are best friends

M3

GRADES 4-5 | 4th – 5th Grade

“Your body is about 60% water. Your kidneys process all of it, adjusting every minute. Too much water? They remove the extra. Too little? They conserve. It's called homeostasis.

LEARNING OBJECTIVES

1. Explain kidneys' role in maintaining water balance (homeostasis)
2. Estimate personal daily water needs
3. Design a hydration tracking system

ACTIVITIES

Water Needs Calculator

Math

15 min

One common estimate: body weight (lbs) / 2 = ounces per day, but needs vary by age, activity, weather, and health. Calculate personal estimates. Convert to cups. Students should follow guidance from their family, school, coach, or healthcare provider.

Dehydration Investigation

Research / Science

20 min

Groups research one effect of dehydration: headaches, kidney stones, fatigue, difficulty concentrating. Create a mini-poster. Gallery walk.

Hydration App Design

Design / Math

20 min

Design a paper prototype hydration tracker app. Include: daily goal, hourly reminders, progress bar, hydration checker, streaks/badges.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Hydration: Record your water estimate. Track intake for 3 days. Graph results. Did you meet your goal?

ASSESSMENT

Written response: Explain homeostasis in relation to kidneys and water. What happens with too much or too little?



TEACHER NOTE

Activities in this lesson are for general education only and should not be used to assess a child's health.

MATERIALS NEEDED

- Clear cups (3 per child for K-1)
- Water pitchers & buckets (2)
- Scoops/ladles
- Water tracker template (printable)
- Plants (1 healthy, 1 wilting)
- Raindrop stickers (2-3)
- Calculator (4-5)



Kidney-Friendly Fuel

Foods that help your kidneys

M4

GRADES 4-5 | 4th – 5th Grade

“ The average American eats 3,400 mg of sodium per day. The recommended limit is 2,300 mg. Your kidneys have to process every milligram.

LEARNING OBJECTIVES

1. Analyze how excess sodium and sugar affect kidney function
2. Compare sodium content across food categories
3. Design a persuasive PSA about kidney-friendly eating

ACTIVITIES

Sodium Data Investigation

Math / Research

20 min

Analyze 10 nutrition labels. Record sodium per serving. Calculate total and percentage of daily limit. Create a ranked bar graph.

PSA Poster Design

Persuasive Writing / Art

20 min

Design a PSA poster: catchy headline, 2 sodium/kidney facts, 3 food swaps, and a visual element for the school hallway.

Salt Impact Experiment

Science

10 min

Filter salty vs. plain water. Time each. Measure residue. Calculate percentage difference. Connect to long-term kidney health.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Nutrition: Track sodium for one dinner. Calculate total vs. recommended limit. Write one food swap.

ASSESSMENT

Written analysis: Compare fast food vs. home-cooked meal for sodium and kidney impact. Include numbers.

TEACHER NOTE

Food activities are simplified and should not label foods as completely good or bad. Encourage balanced eating and follow school nutrition guidance.



MATERIALS NEEDED

- Food picture cards (K-1)
- Empty food packages (various)
- Nutrition labels
- Green/Yellow/Red sorting cards
- Food magazines, glue, scissors
- Poster board & paper plates
- Salt, water bottles, coffee filters



When Kidneys Need Help

Kidney disease, empathy, and how we support friends

M5

GRADES 4-5 | 4th – 5th Grade

“ Sometimes kidneys do not work as well as they should and need help from doctors, medicines, or treatments. Some children and adults live with kidney disease. Let's learn about what that means and how we can be supportive.

LEARNING OBJECTIVES

1. Understand that some people's kidneys need medical support
2. Learn about treatments such as dialysis
3. Write a thoughtful reflection on empathy and inclusion

ACTIVITIES

Clogged Filter + Data

Science + Analysis

15 min

Block 25%, 50%, 75% of filter with clay. Time each. Graph results. Discuss how doctors may use treatments such as dialysis to help when kidneys are not working well.

A Day in Their Shoes

Empathy / Writing

20 min

Read 3 anonymized profiles of kids with kidney disease -medication, dialysis, post-transplant. Journal responses. Share in small groups.

Inclusion Action Plan

Discussion / SEL

15 min

Brainstorm: How to include classmates with health conditions in sports, parties, field trips? Create a written Inclusion Action Plan poster.

TAKE-HOME CONNECTION

Kidney Explorer Packet, Empathy: Reflection journal entry (5+ sentences) about what you've learned about kidneys. What was most surprising? Complete the packet!

ASSESSMENT

Essay: Explain, in age-appropriate terms, what may happen when kidneys are not working well and describe two ways kidney disease is treated. Then explain why empathy matters.

TEACHER NOTE

Present kidney disease in a calm, age-appropriate way. Avoid asking students to share personal diagnoses or family medical information.



MATERIALS NEEDED

- Coffee filters, clay, dirty water (from Filtration activity)
- Stuffed animal with bandage (K-1)
- Card stock or construction paper
- Markers, stickers, glitter glue
- Kidney mascot templates (printable)
- Poster paper for class promise
- Certified Kidney Explorer certificates
- Student profiles (anonymized, 4-5)
- Short story about child with kidney disease (2-3)



Standards Connections

These activities are designed to support the following NGSS and SEL learning goals.

Next Generation Science Standards (NGSS)

- K-LS1-1:** Use observations to describe patterns of what plants and animals need to survive. (Kidneys 101, Hydration)
- 1-LS1-1:** Use materials to design a solution to a human problem by mimicking organism structures. (Filtration activity)
- 3-LS1-1:** Develop models to describe that organisms have unique life cycles. (Kidneys 101, Filtration)
- 4-LS1-1:** Construct an argument about internal structures that support survival. (Kidneys 101 through Nutrition)
- 5-LS1-1:** Support an argument that plants get materials for growth from air and water. (Hydration)
- 5-PS1-3:** Make observations to identify materials based on properties. (Filtration activity)

Social-Emotional Learning (SEL) Competencies

- Self-awareness:** Understanding how personal choices affect the body. (Hydration, Nutrition)
- Social awareness:** Recognizing peers' health challenges; practicing empathy. (Empathy)
- Responsible decision-making:** Making kidney-friendly food and drink choices. (Hydration, Nutrition)
- Relationship skills:** Collaborative activities, supportive communication. (All activities)



Materials Checklist

Photocopy this page and check off items as you gather them.

Kidneys 101: Meet the Kidney Crew!

- Butcher paper or felt body outline
- Kidney bean-shaped cutouts (felt or paper)
- Glue sticks & googly eyes
- Markers/crayons & rulers
- Real kidney beans (dried)
- Body diagram worksheets
- Kidney Fact Sheet printable
- Kidney Explorer Packets (printable provided)

Filtration: The Super Filter Factory

- Soil/dirt & water pitchers
- Clear cups (2 per group)
- Coffee filters & funnels
- Red & blue pom-poms
- Black paper (for crumpling)
- 2 bins per group (KEEP / REMOVE)
- Drawing paper & markers
- Gravel, sand, cotton balls (4-5)
- Nephron reference sheets (4-5)

Hydration: The Water Balance Game

- Clear cups (3 per child for K-1)
- Water pitchers & buckets (2)
- Scoops/ladles
- Water tracker template (printable)
- Plants (1 healthy, 1 wilting)
- Raindrop stickers (2-3)
- Calculator (4-5)

Nutrition: Kidney-Friendly Fuel

- Food picture cards (K-1)



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- Empty food packages (various)
 - Nutrition labels
 - Green/Yellow/Red sorting cards
 - Food magazines, glue, scissors
 - Poster board & paper plates
 - Salt, water bottles, coffee filters

Empathy: When Kidneys Need Help

- Coffee filters, clay, dirty water (from Filtration activity)
- Stuffed animal with bandage (K-1)
- Card stock or construction paper
- Markers, stickers, glitter glue
- Kidney mascot templates (printable)
- Poster paper for class promise
- Certified Kidney Explorer certificates
- Student profiles (anonymized, 4-5)
- Short story about child with kidney disease (2-3)

Safety Note: Teachers should supervise all activities involving water, food packaging, scissors, and small objects. Check school allergy and safety policies before use.

The Kidney Explorers is provided free by **Nephraware.org**.
Questions or feedback? Contact **nephraware@gmail.com**.



Printable Resources

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● **Kidney Explorer Packet Pages**

One page per activity -students collect all 5

● **Badges**

Cut-out badges to earn after each activity

● **Hydration Hero Tracker**

Water tracking sheet (Hydration activity)

● **Certified Kidney Explorer Certificate**

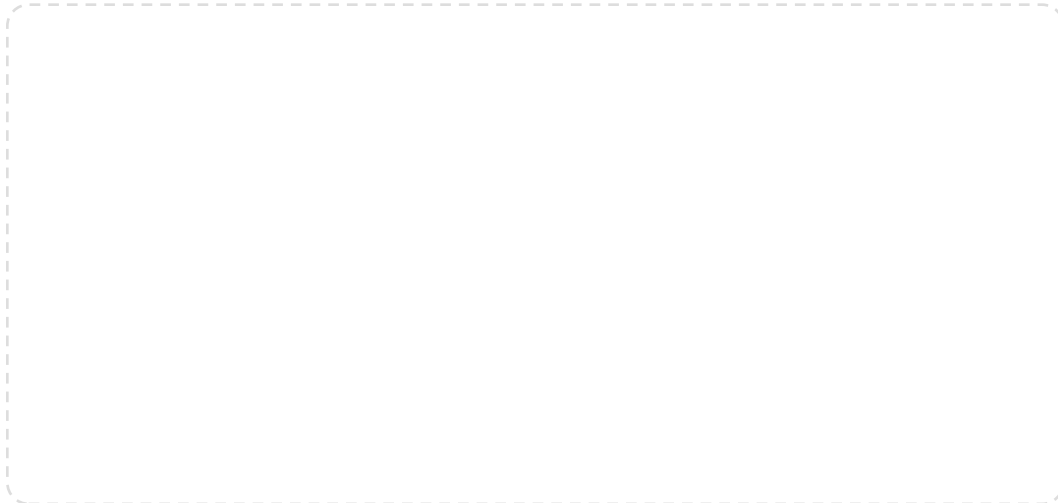
Award for completing any activities

Meet the Kidney Crew!



What I Learned:

Draw or Illustrate:



Talk About It at Home:

Kidney Explorers • Nephraware.org

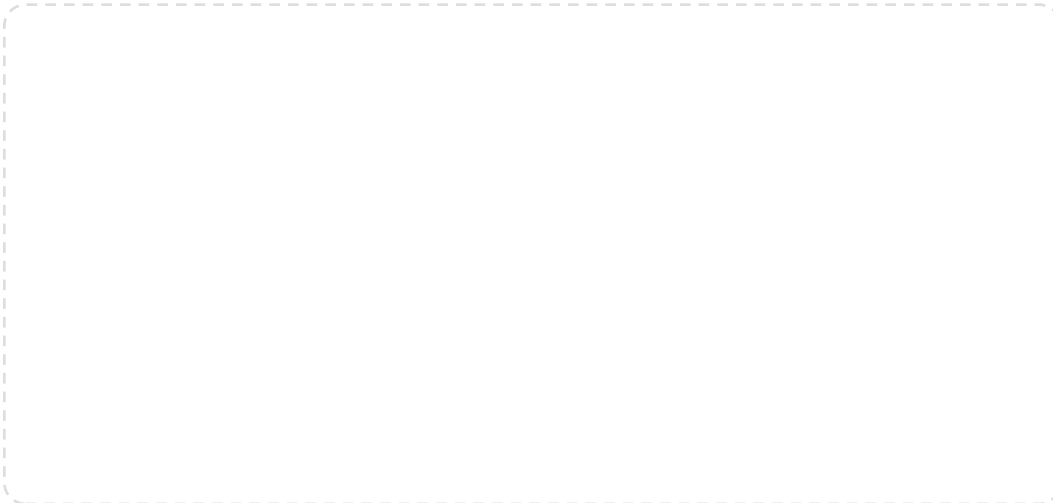
Did you know? Your kidneys are about the size of your fist!

The Super Filter Factory



What I Learned:

Draw or Illustrate:

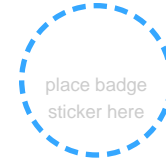


Talk About It at Home:

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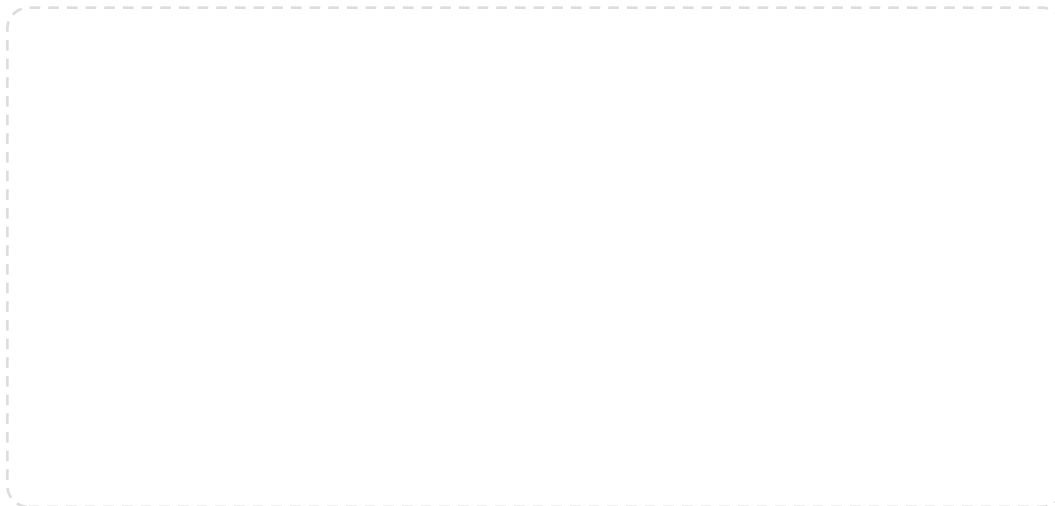
Fun fact: Your kidneys help filter about 150 liters of fluid every day!

The Water Balance Game



What I Learned:

Draw or Illustrate:

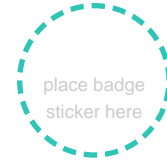


Talk About It at Home:

Kidney Explorers • Nephraware.org

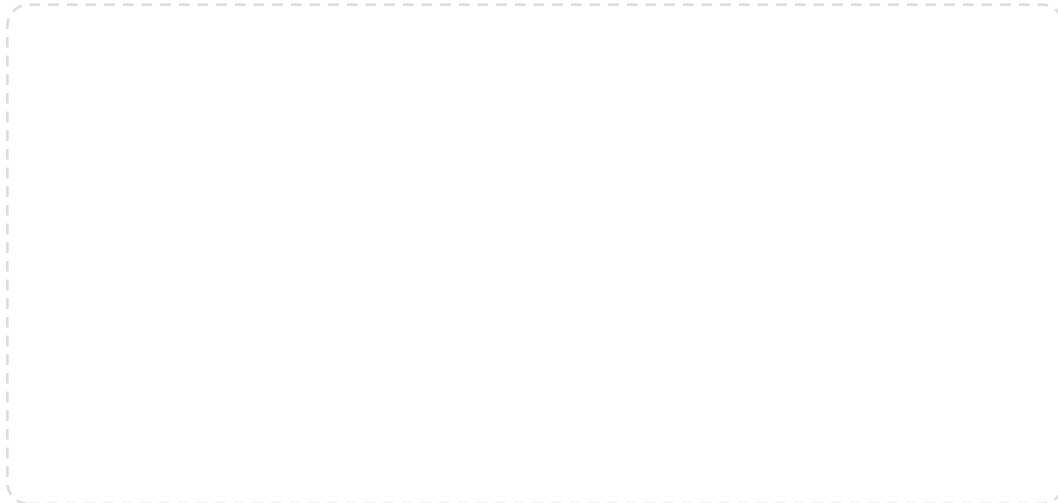
Water power: Drinking water helps your kidneys stay healthy!

Kidney-Friendly Fuel



What I Learned:

Draw or Illustrate:



Talk About It at Home:

Kidney Explorers • Nephraware.org

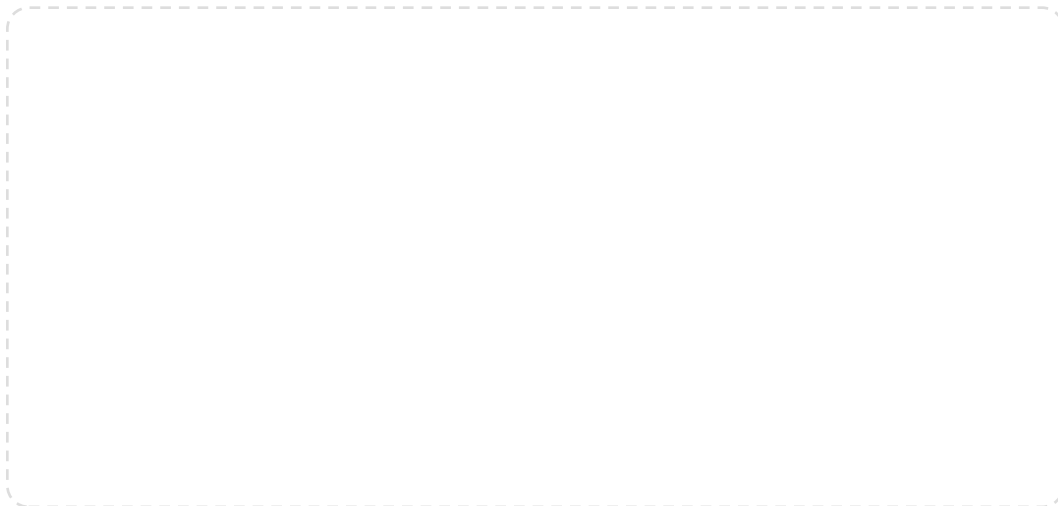
Food tip: Fruits and veggies are kidney-friendly superfoods!

When Kidneys Need Help



What I Learned:

Draw or Illustrate:



Talk About It at Home:

Kidney Explorers • Nephraware.org

Kindness counts: Being supportive helps everyone feel better!

Badges -Cut Along Dashed Lines

Students earn one badge per activity. Cut out and glue into Kidney Explorer Packet!

For educational participation only. Not a medical certification.



My Hydration Hero Tracker

Color in a drop for each cup of water you drink!

Name: _____

My Goal: _____

cups per day

MON	TUE	WED	THU	FRI	SAT	SUN
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8

Did you reach your goal today? Circle: YES / ALMOST / I'LL TRY AGAIN TOMORROW

Hydration needs vary from person to person. Use a goal that fits your age, activity, weather, and guidance from a parent, teacher, coach, or healthcare provider.



CERTIFICATE OF ACHIEVEMENT

Certified Kidney Explorer

This certifies that

(student name)

has successfully completed

The Kidney Explorers

and demonstrated knowledge of kidney health, hydration, nutrition, and empathy.



Date

Teacher Signature

Nephraware.org

Empowering Kidney Health Awareness

Awarded for participation in educational activities.