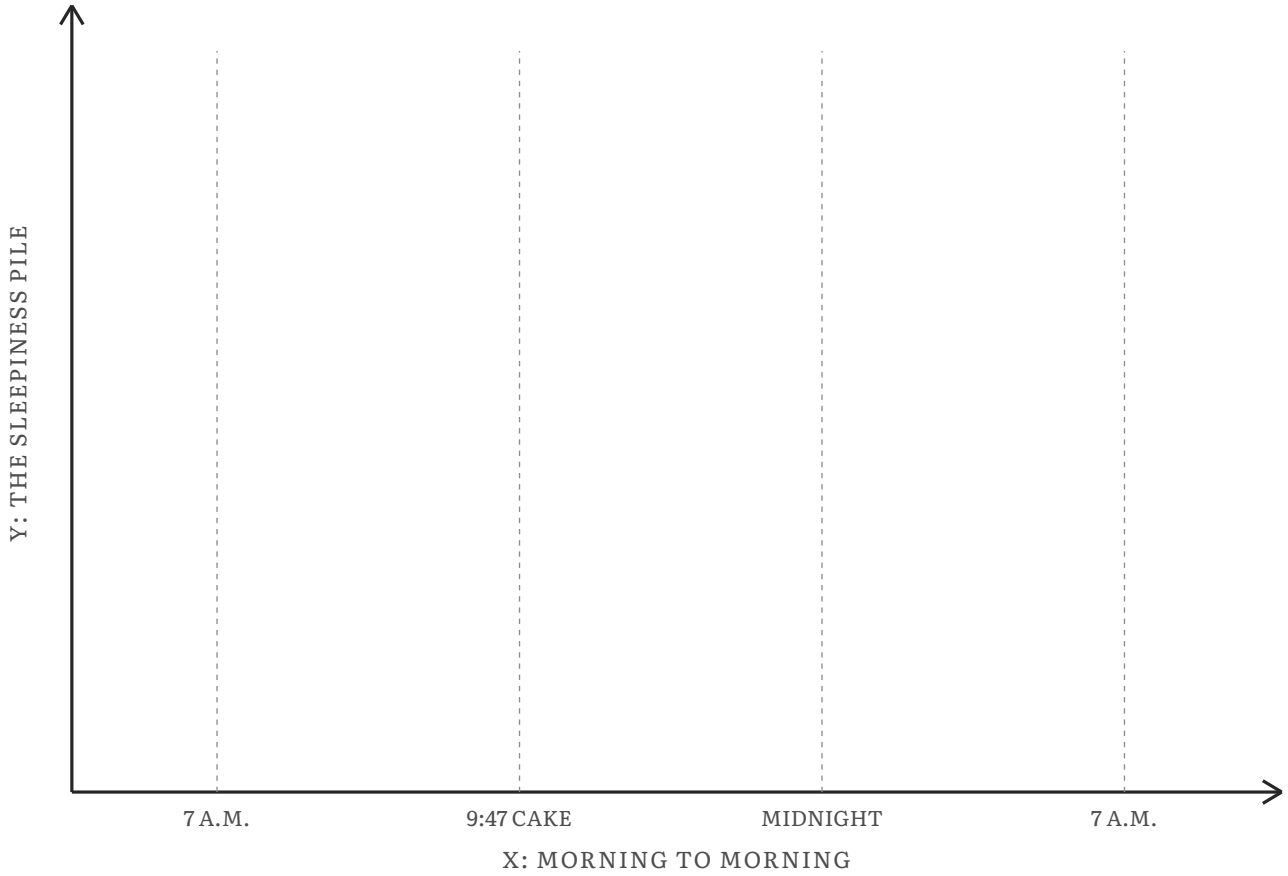
Draw the Sleepiness Pile

Read a line graph and connect it to the story.

Ages 7–9 · 15 min · Book link: Lab Notes, page 42

1. Look at Jiwoo's graph on page 42. Find 7 A.M., 9:47 CAKE, MIDNIGHT and the next 7 A.M.
2. On your sheet, draw Jiwoo's pile growing from Friday morning until she finally falls asleep. Then draw it shrinking while she sleeps — sleep is the only thing that shrinks it. Write THE CAKE at 9:47.
3. Now draw a second line in another color for a made-up day: the same cake, but at noon. Label it MY GUESS.



☐ **Jiwoo's night** (color 1) ☐ **MY GUESS — cake at noon** (color 2)

Talk about it — caffeine didn't shrink Jiwoo's pile. So why didn't she feel sleepy?

Same cake. Wrong clock. — L.

The Sleepiness Chair Game

Model how caffeine blocks the sleepiness signal — and why the same cake at noon and at 9:47 p.m. makes two different nights.

Ages 6–9 · 20–25 min · Book link: Chapter 6 and Lab Notes, pages 42–45

YOU NEED

Three chairs in a row, 20 paper SLEEPY squares (printable), three boxes labeled THE PILE, FACTORY and BRAIN, role cards, music you can start and stop. Signs, role cards and squares are on the next pages.

HOW TO PLAY

1. Set up three chairs in a row — the Sleepiness Chairs. Put THE PILE (14 squares) in front of them and BRAIN behind them. Put FACTORY (6 squares) by the light switch.
2. Hand out roles: two Caffeine, one Brain, one Clock (a grown-up works well), two Melatonin Factory workers, and everyone else as Adenosine — the sleepiness signal.
3. How a message gets through: Adenosine players walk (no running) around the chairs while the music plays. When it stops, anyone who finds an empty chair sits and drops a square from THE PILE into BRAIN. At 8 squares, the Brain yawns: "Time for bed."
4. Round 1 — cake at noon. By bedtime most of that caffeine is gone, so Caffeine watches from the side. Lights off: the Factory carries squares to BRAIN too. How many stops until bed?
5. Round 2 — cake at 9:47. Squares back in their boxes. Caffeine sits in two chairs and stays. Lights off — but while Caffeine is sitting, the Factory waits at the curb: caffeine makes it start late. Play three stops. Is THE PILE any smaller?
6. Round 3 — wearing off. Keep going from Round 2. The Clock calls MIDNIGHT, then 1:00 (one Caffeine leaves), then 2:00 (the other leaves). When does the Brain finally say it?
7. Talk: did Caffeine make the pile smaller, or just keep the seats? Which two jobs went wrong? What is still in THE PILE at the end — and how would that feel in the morning?

For the grown-up

It's a model, so it simplifies. Real caffeine doesn't fill every chair or shut the factory: it takes some of the chairs, can make the factory start later, and wears off slowly over hours. Adenosine and melatonin are two different signals, not one kind of square, and adenosine sits down all day, not only at bedtime. The chair is really a receptor — Lumi admits it on page 43: "The chair is not really a chair." If a child has trouble sleeping, let them choose their role, and don't ask about their nights.

Caffeine isn't mean. It just sat down first. — L.

Who's who in your brain at night

ADENOSINE

EVERYONE ELSE

When the music stops, find an empty chair, sit, and drop one square from THE PILE into BRAIN. No empty chair? Keep walking.

CAFFEINE

ROUNDS 2 AND 3

Sit in a Sleepiness Chair before the music starts. Carry nothing. Stay put until the Clock says you've worn off.

CAFFEINE

ROUNDS 2 AND 3

Sit in a Sleepiness Chair before the music starts. Carry nothing. Stay put until the Clock says you've worn off.

BRAIN

ALWAYS ON DUTY

Stand behind the chairs with the BRAIN box. Count each square out loud. At 8, yawn and say "Time for bed."

CLOCK

A GROWN-UP IS GREAT

Start and stop the music. Switch the lights off at bedtime. In Round 3, call the times and tell Caffeine when to leave.

MELATONIN FACTORY

LIGHTS-OFF CREW

Lights off and no Caffeine in a chair? Carry squares from FACTORY to BRAIN, one at a time. Otherwise wait at the curb — caffeine makes the factory start late.

MELATONIN FACTORY

LIGHTS-OFF CREW

Lights off and no Caffeine in a chair? Carry squares from FACTORY to BRAIN, one at a time. Otherwise wait at the curb — caffeine makes the factory start late.

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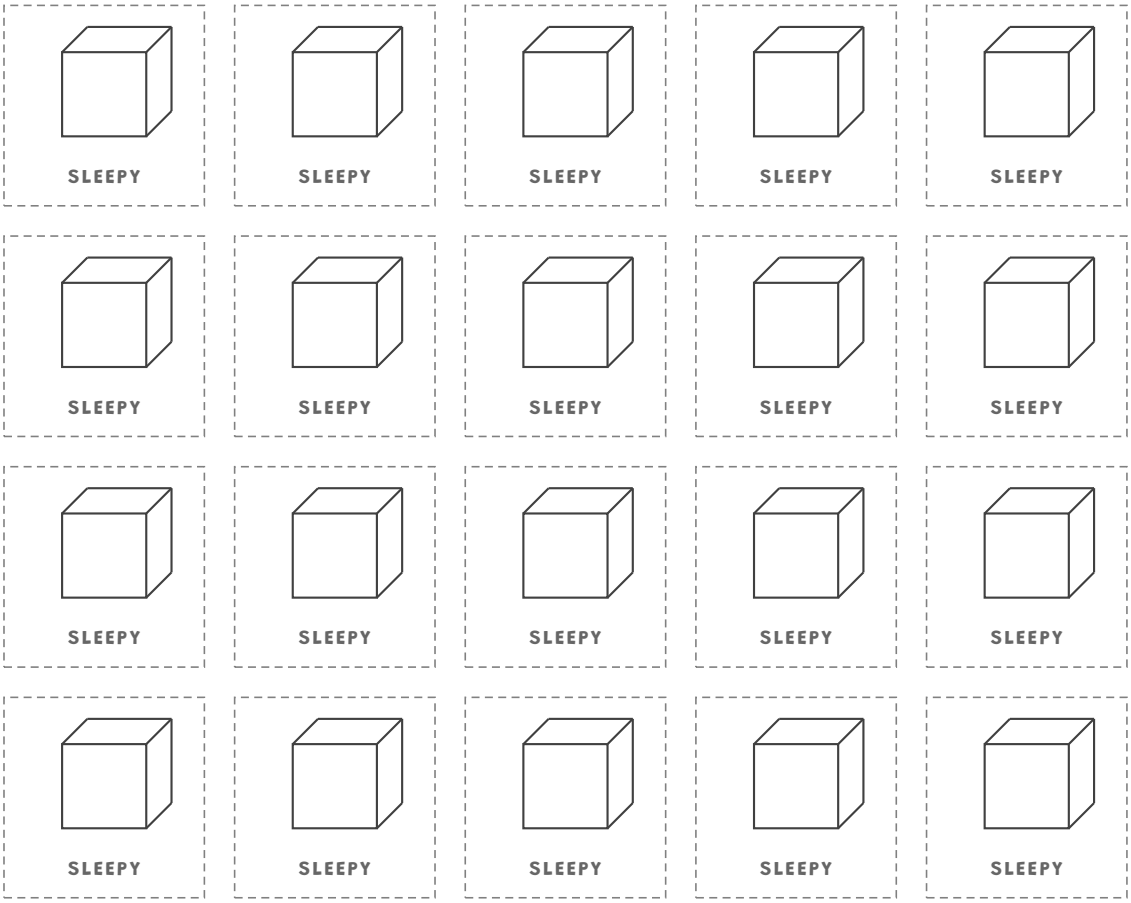
Signs for the boxes

THE PILE

FACTORY

BRAIN

20 SLEEPY SQUARES



Four Things, One Night

Tell causes from coincidences, then plan a fair test that changes one thing.

Ages 7–9 · 15–20 min · Book link: Lab Notes, pages 46–47

1. Cut out the twelve cards. Sort them onto the mat: Part of the late night or Just true that night.
2. Check your sort against Lumi's list on page 46. Did you find all four?

At 9:47 at night	**Maya sat upside down on the couch**	**Caffeine from three places**
Theo calls his parent 'management'	**Lumi sat on top of the fridge**	**Jiwoo's pajamas had stars on them**
One big slice	**We stayed up anyway**	**The cake was for Coach Lee**
Jiwoo's sleeping bag had a snack pocket	**The cake sat on a white plate**	**The pretzel bags said SOCCER SATURDAY**

Cut on the dashed lines.

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Part of the late night — or just true?

PART OF THE LATE NIGHT	JUST TRUE THAT NIGHT

Look at the Coach Lee card again. It didn't keep anyone awake — but it still mattered. Why isn't it in Lumi's file? (Page 49: "It wasn't about bodies.")

MY FAIR TEST

I will change: _____

I will keep the same: _____

I will notice: _____

Change one thing at a time. Change all four and you learn nothing. — L.

Label Detective: SOCCER SATURDAY

Notice what the words on a package tell you — and what they leave out.

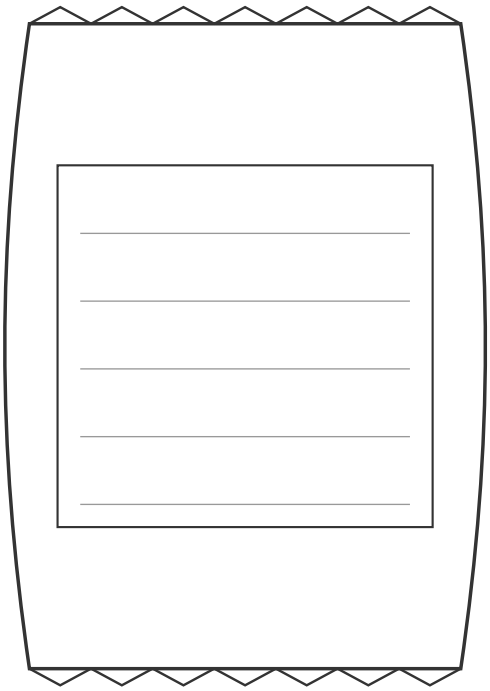
Ages 7–9 · 20 min · Book link: Chapter 3 and Lab Notes, pages 40–41

The pretzel label



Now reads labels on chocolate.

Your honest label



1. What do the words on the bag tell you?

2. Which word is a clue that there's a little caffeine inside?

3. What does the bag NOT tell you?

4. Who were the pretzels saved for — and how could you find out?

Grown-ups: This activity is about words, not numbers. Please don't turn it into counting milligrams — the book leaves milligram charts out on purpose (page 70). The bonus is for looking, not tasting.

Nobody writes CAFFEINE on a cake. Cocoa is the clue. — L.

Lumi on the Lampshade

Write in Lumi's lab-report voice and retell an ordinary evening like a scientist.

Ages 6–9 · 15–20 min · Book link: Chapters 5–8

1 · Lumi shows up on…

2 · What time was it? I was about to…

3 · Lumi writes on her clipboard:

"Recording: _____

4 · Later, I noticed…

Lumi's style: short, calm, a little dry. "Recording: subject has been warned." · "Case study #002. Three subjects. Documenting." · "Welcome to the Caffeine Hour."

I don't shout. I never have to. I just write it down. — L.

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Word Lab Workout

Practice the words a scientist needs, from Lumi's Word Lab.

Ages 7–9 · 15 min · Book link: Lumi's Word Lab, pages 52–63

1 · FIND ALL 17 WORDS (across, down or diagonal)

H	Y	P	O	T	H	E	S	I	S	W	C	I	S
B	L	O	C	K	S	S	H	A	B	I	T	M	T
F	M	H	M	T	T	E	S	L	W	N	C	H	I
V	E	M	E	G	H	N	N	H	G	D	A	S	M
T	X	I	L	R	M	S	A	A	A	-	F	I	U
I	P	L	A	R	I	I	D	I	G	D	F	V	L
M	E	L	T	M	N	T	E	O	P	O	E	M	A
I	R	I	O	M	S	I	N	B	C	W	I	H	N
N	I	G	N	D	O	V	O	S	H	N	N	R	T
G	M	R	I	G	M	I	S	E	C	L	E	G	R
V	E	A	N	V	N	T	I	R	O	A	R	W	D
M	N	M	W	C	I	Y	N	V	C	Y	D	N	A
G	T	R	F	O	A	W	E	E	O	L	C	N	T
R	E	C	E	P	T	O	R	P	A	N	C	F	A

- ☐ DATA
- ☐ OBSERVE
- ☐ HYPOTHESIS
- ☐ EXPERIMENT
- ☐ CAFFEINE
- ☐ STIMULANT
- ☐ COCOA
- ☐ MILLIGRAM
- ☐ ADENOSINE
- ☐ RECEPTOR
- ☐ BLOCK
- ☐ MELATONIN
- ☐ INSOMNIA
- ☐ SENSITIVITY
- ☐ TIMING
- ☐ HABIT
- ☐ WIND-DOWN

2 · MATCH THE WORD TO LUMI'S DEFINITION

STIMULANT	☐	A How strongly YOUR specific body responds to something.
ADENOSINE	☐	B A hormone your body makes when it gets dark outside.
BLOCK	☐	C A chemical in your brain that makes you feel sleepy.
MELATONIN	☐	D Something that makes your body and brain speed up.
INSOMNIA	☐	E A test you design to find out if something is true.
HABIT	☐	F When one chemical sits in a spot that another chemical was supposed to use.
SENSITIVITY	☐	G A behavior you repeat so many times that it becomes automatic.
EXPERIMENT	☐	H When someone has trouble falling asleep or staying asleep night after night.

Learn them now and you'll never need me to explain them again. I'd rather be collecting data anyway. — L.

Word Lab Workout — answers

For grown-ups and for checking your own work afterwards.

H	Y	P	O	T	H	E	S	I	S	W	C	I	S
B	L	O	C	K	S	S	H	A	B	I	T	M	T
F	M	H	M	T	T	E	S	L	W	N	C	H	I
V	E	M	E	G	H	N	N	H	G	D	A	S	M
T	X	I	L	R	M	S	A	A	A	-	F	I	U
I	P	L	A	R	I	I	D	I	G	D	F	V	L
M	E	L	T	M	N	T	E	O	P	O	E	M	A
I	R	I	O	M	S	I	N	B	C	W	I	H	N
N	I	G	N	D	O	V	O	S	H	N	N	R	T
G	M	R	I	G	M	I	S	E	C	L	E	G	R
V	E	A	N	V	N	T	I	R	O	A	R	W	D
M	N	M	W	C	I	Y	N	V	C	Y	D	N	A
G	T	R	F	O	A	W	E	E	O	L	C	N	T
R	E	C	E	P	T	O	R	P	A	N	C	F	A

MATCHING

STIMULANT — D

ADENOSINE — C

BLOCK — F

MELATONIN — B

INSOMNIA — H

HABIT — G

SENSITIVITY — A

EXPERIMENT — E

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Junior Scientist Badge

Celebrate thinking like a scientist — whatever the result.

Ages 6–9 · 10 min · Book link: Think Like a Scientist, page 50



Scientist: _____

Lab partner: _____

Date: _____

This badge is for the question marks too. Real lab notebooks are full of them. — L.