How loud is the **noise**? and is the 🔊))) nice or irritating?
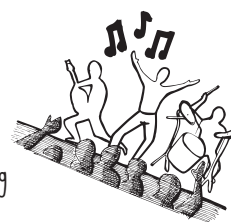
SMART KIDS LAB
Step by step

# SMART KIDS LAB

How clean is the air you breathe? Is swimming water the same as drinking water? How many microbes live in the soil beneath your feet? And what does it all mean? DISCOVER how healthy your neighbourhood is and what you can do to improve it. SMART KIDS LAB lets you examine the water, noise, air, earth and light around you with homemade measuring instruments. On the smartkidslab.nl website, you'll find out how to make the measuring instruments (meters) and how you can GET STARTED.

BEEP BEEP
BEEP BEEP
BEEP BEEP
BEEP BEEP
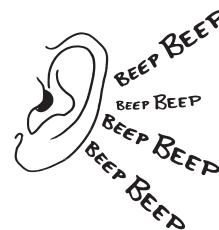
## HOW LOUD IS THE NOISE??

You are investigating NOISE POLLUTION in your area. Where is it QUIET and where is it TOO LOUD? Is the screaming on the playground too noisy? Maybe it's your sister's violin lesson? Or the cars on the highway? We express noise levels in decibels (dB). 10 decibels is as quiet as a falling leaf and 180 decibels is as loud as a rocket launching into space.

## HOW DOES IT WORK?

It all begins with the QUESTION: What do you want to measure? Do you already know? GREAT! Now you can GET GOING.

### STEP 1.

You start by making the MEASURING INSTRUMENT. *What you'll need: Smart Kids Lab / making meters. There you'll find all the information you need to get started.

### STEP 2.

Now it's time to go do RESEARCH and experiment. Before you start, think about what you want to investigate in your area and how to go about doing it.

For example, do you want to find out where quietest place in your neighborhood is, or do you want to investigate how LOUD the noise is at your school? Maybe try taking measurements at both places and comparing them.

*What you'll need: the Smart Kids Lab / experiments worksheet. This explains how to use your homemade meter to collect data.

### STEP 3.

Collect the measurement DATA on the Smart Kids Lab worksheet. *What you'll need: the Smart Kids Lab / experiments worksheet. You can record your measurements here.

### STEP 4.

Go grab the COMPARE-O-METER so you can compare your measurement data to that of others. You'll also find a lot of interesting information here. *For this you'll need: Smart Kids Lab / compare-o-meter worksheet.

### STEP 5.

Take a picture of your measurement data and put it on the GREAT DATA MAP. You can find it at smartkidslab.nl.

*What you'll need: You can take a photo with a phone or digital camera. THE GREAT DATA MAP can be found at smartkidslab.nl (in the menu bar).

COMPARE YOUR DATA

270 dB
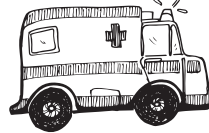
VOLCANIC-
ERUPTION

INSTANTLY HURTS YOUR EARS!

180 dB
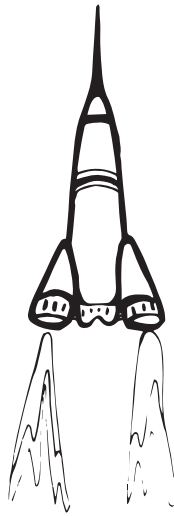
a LION'S roar can really hurt your ears...
(other body parts are in danger too if you don't run!)

ROAR

130 dB

WEE WOO WEE WOO

BEEP BEEP
BEEP BEEP
BEEP BEEP
BEEP BEEP

100 dB
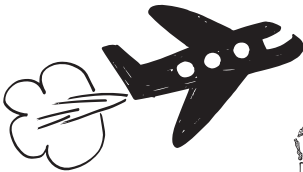
You can DAMAGE your hearing if you listen to loud music!

SCHOOL PLAYGROUND
with children playing

SCHOOL

90 dB

70 dB

SO MUCH NOISE!!!

NOT IRRITATING if you vacuum yourself
VERY IRRITATING IF someone else does it!

50 dB

NO SNORING ALLOWED!

ZZZ ZZ

PSSSSSSZZZ

IRRITATING MOSQUITO BUZZ!!

30 dB

20 dB

Hopefully you don't hear these noises in your bedroom at night

0 dB
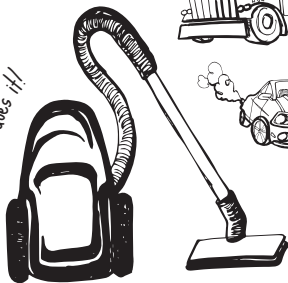
# How loud is the noise?

and is the 🔊)) nice or irritating?

SMART KIDS LAB
## making Meters

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# DISCOVER HOW HEALTHY YOUR NEIGHBORHOOD IS AND WHAT YOU CAN DO TO IMPROVE IT!

Sound is all around us. It's almost never completely quiet, certainly not in the city. But when do noises start to cause problems? Can soft sounds be annoying? Are noises irritating depending on who is listening?
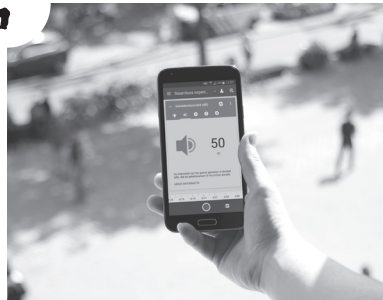
You can measure how loud a sound is with a DECIBEL METER. Let's install it on your smartphone!

## WHAT DO YOU NEED?

Smartphone (Android):
'Science - journal' app

Do you have an iPhone? Use the 'Sound Meter Free' app

**1.**



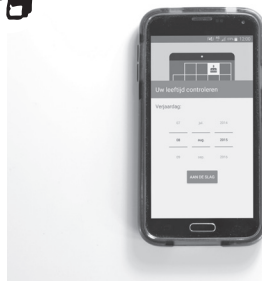Making a decibel meter is really easy. You just need a smartphone!

**2.**



Go to the Playstore and download the 'Science - journal' app from Marketing @ Google.

**3.**



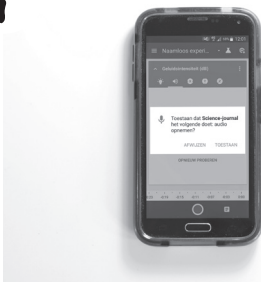Install the app and open it.

**4.**



If you're using the app for the first time, you'll need to press the 'next' button a few times.
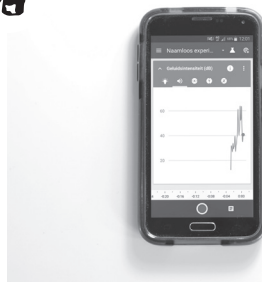
**5.**



The app would like to know how old you are, so fill in something next to your date of birth.

**6.**



In the blue box, press the loud speaker icon.

**7.**



Allow permission to record audio. You can now see, in decibels, how loud the noise levels are.

## TIP

Measure the sound on your street at different times throughout the day and record the differences. Are there any differences between weekdays and weekends? Why do you think that is?

A sound's decibel measurement is also related to the distance the decibel meter is from the sound's source. Try it out!
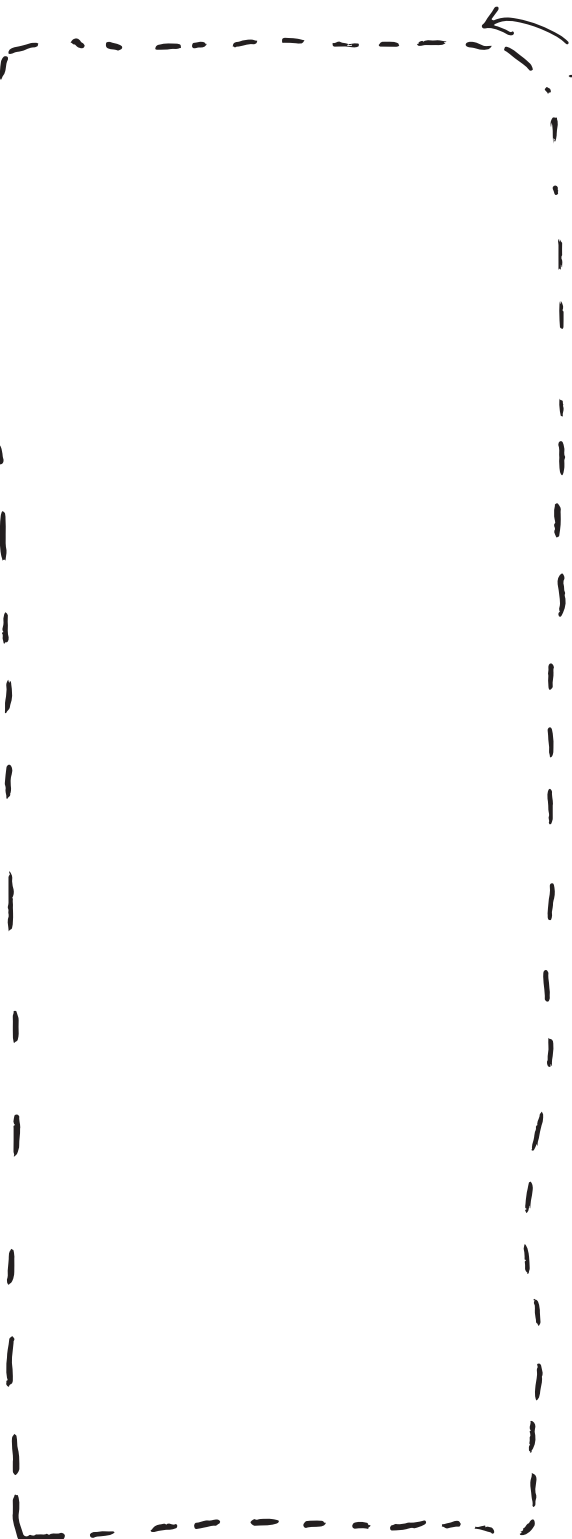
# How loud is the noise?

and is the 🔊)) nice or irritating?

**Step 1** Start your noise meter and measure noise levels in 5 different places in your neighbourhood. Inside, outside, at different distances from something that makes sound. Record the noise levels in decibels (dB) each time.
TIP: You can also measure the loudness of traffic or pedestrians at different times during the day. Always measure from the same place to be able to compare well.
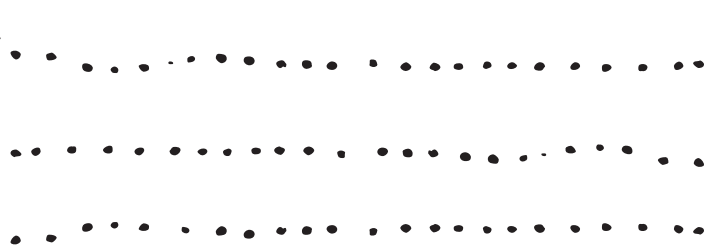
**Step 2** Draw the places where you did your sound measurements and what caused different noises below.

**Step 3** Record all your sound measurements below. Was the noise was nice or irritating? Remember to note what time of day you measured and the distance from your meter to the sound's source.

IRRITATING!

Sound: .............. ...... dB
date: ........ time: ........
distance: ........ .....meter(s)

Sound: .............. ...... dB
date: ........ time: ........
distance: ........ .....meter(s)

Sound: .............. ...... dB
date: ........ time: ........
distance: ........ .....meter(s)

Sound: .............. ...... dB
date: ........ time: ........
distance: ........ .....meter(s)

Sound: .............. ...... dB
date: ........ time: ........
distance: ........ .....meter(s)

**Step 4**

Compare your measurements to the sounds on the compare-o-meter. Is the noise in your neighbourhood as damaging as a lion's roar or as annoying as the sound of a mosquito? What solutions can you come up with to reduce disturbing sounds in your neighbourhood?

MY RESEARCH CONCLUSION:

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**Step 5** Take a picture of this worksheet & put it on the BIG data map at SMARTKIDSLAB.NL