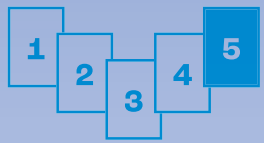


TEAM ATMOSPHERE

Polar research has shown that the climate crisis is serious. We have to work together for change. Let's start!



You can add more research missions here.

**Come along on a
climate expedition!**

THIN ICE

**This is what
we want from politics:**

**This is
what we'll do:**

Deutsches Museum
VERKEHRSZENTRUM 

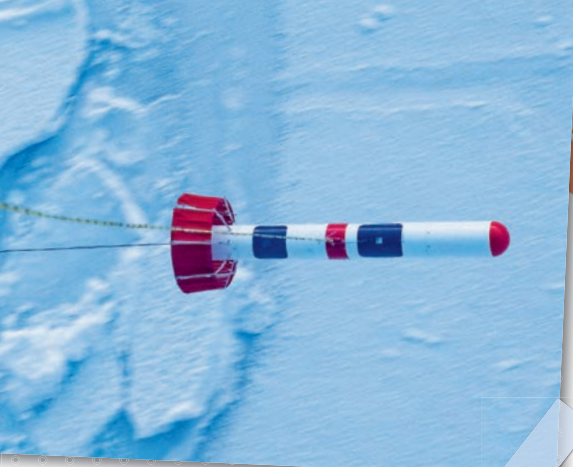
 **Deutsches
Technik
museum**



ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR-
UND MEERESFORSCHUNG

An exhibition of the Deutsches Technikmuseum in cooperation with the
Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung.

SEA ICE



Find the sensor!

3

Sea Ice Measurement

The Sea Ice Team measures the thickness of the ice with many different instruments.

This one is called:

How safe is the floe?

If we want to do research on the floe, it has to have a certain thickness. With the Sea Ice Team, we use the thickness gauge to take measurements.

thinnest point:

measuring point number:

measure and write down.

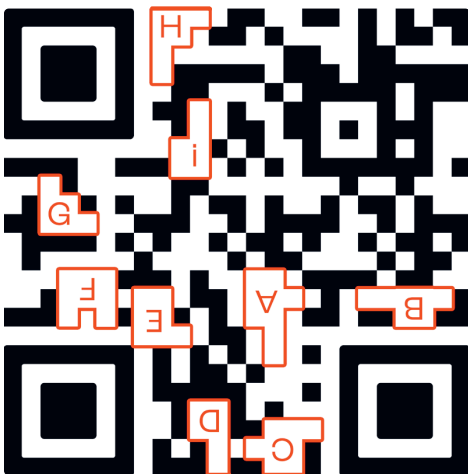
Ready? Go on board and scan your code on the computer! ☺

Sea ice as a lid

The ice has a major influence on the climate at the North Pole. It...

Which part should we color in?

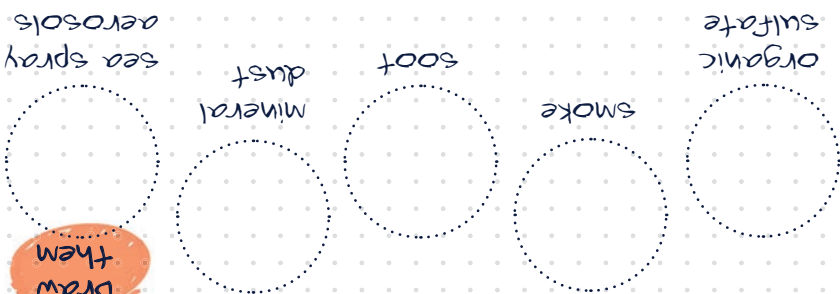
- G holds nitrogen in the sea.
- H reflects solar radiation.
- i keeps polar bears away from the water.



- D the ship has a leak.
- E it's the period of the diatom bloom.
- F sea ice melts and the ocean is exposed.

Thriller in the arctic?
We found a very large amount of one of the aerosols. One explanation could be that...

Color in the right field



Aerosols

We can examine aerosols with a light radar. We take the lamp to determine the aerosols. We found these:

ATMOSPHERE



Find the balloon!

Balloon Town

We use our favorite balloon to take measurements at an altitude of 1,500 meters. Its nickname is:

2

TEAM ATMOSPHERE

A Research Diary for the exhibition THIN ICE

Our team goes hunting for clouds and winds and also looks after Miss Piggy. Ready? Your mission starts NOW!

Name(s):

Date: Temperature: - 16°C

Our stations:

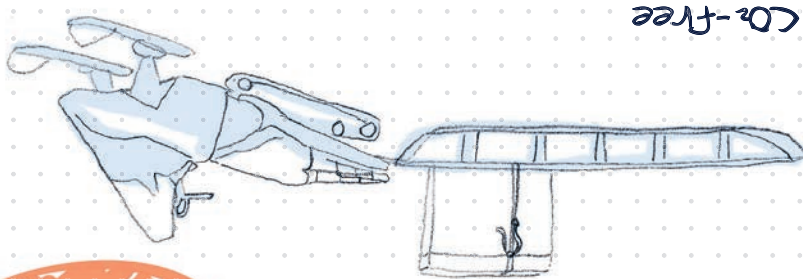


Scan the coloured code on the climate-computer

Deutsches Museum VERKEHRSZENTRUM

Deutsches Technik museum

TRANSPORTATION



Put... no, draw everything on the sled

How can we move all this?? 3 large aluminum boxes with measuring instruments, 1 large extension reel, 6 signal flags, 1 survival pack, and the entire team...

Packing up ☺

What a distance!

Phew, the atmosphere research station is quite far away. Today we take the snowmobile for once, even though it emits CO₂. Kilometers driven so far:

Find the snowmobile



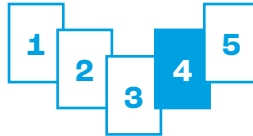


TEAM SEA ICE

Polar research has shown that the climate crisis is serious. We have to work together for change. Let's start!

This is
what we'll do:

This is what
we want from politics:



You can add more
research missions
here.

Come along on a
climate expedition!

THIN ICE



Find the tool!

Tool exchange

One of our most important tools is also used by The Biogeochemistry Team:

Ice for the Lab

We prepared a delivery of ice core samples for the Biogeochemistry Team. They examined the substances trapped in the ice. They found:

☐ air bubbles ☐ sand ☐ animals ☐ metal



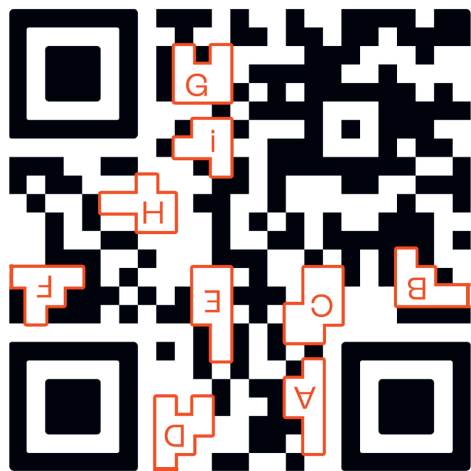
Ready? Go on board and scan your code on the computer! ☺

Methane ALERT!!!

When ice melts, methane is emitted into the atmosphere. That's dangerous, because...

- G it stinks.
- H it fuels the greenhouse effect.
- i it is explosive.

Color in the right part in the QR code.



D ≈ 7% F ≈ 20% E ≈ 60%

Less sea ice = less reflection of solar radiation = faster melting of sea ice. Bright snow surfaces reflect about 90%, while the dark ocean reflects only...

A Dangerous Albedo-Spiral ☹

HMM... which part do we color in?

measure, mark, and connect the dots to draw the floe

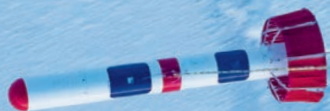
50 cm
100 cm
150 cm
200 cm



Measuring the ice floe
Today we'll use the ice thickness gauge. We'll drill holes in the ice and measure its thickness. Surprisingly, it is not smooth on the underside at all!

EM-Bird
With this towed sensor we measure:

Find the sensor!



TEAM SEA ICE

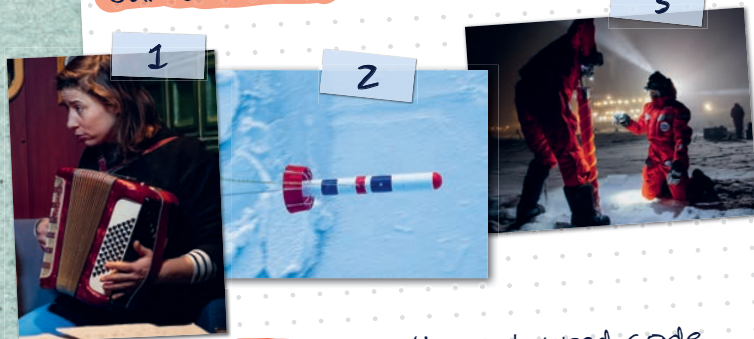
A Research Diary for the exhibition THIN ICE

Our team explores ice change and what different colours mean for climate change! Ready? Your mission starts NOW!

Name(s):

Date: Temperature: - 80C

Our stations:



Scan the coloured code on the climate-computer.

Deutsches Museum
VERKEHRZENTRUM

Deutsches
Technik
museum

Which field should we color in???

- A vegan.
- B with meat.
- C vegetarian.

Lunch
for today's lunch we choose the "Wiener Schnitzel". It's...

Free time on board
It's so cramped in the cabin! Fortunately, there are plenty of things to do on the ship.
For this afternoon we are planning to:

Read the explanation and write down!

Not from the Boombox for a change
Making music is great on such a long expedition. The accordion is very suitable for:

Find the instrument!





This is what
we want from politics:

Come along on a
climate expedition!

THIN ICE

TEAM OCEAN

Polar research has shown that the
climate crisis is serious. We have to work
together for change. Let's start!

This is
what we'll do:





3

Find the device!

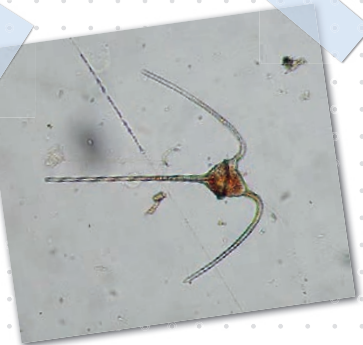
On the hunt!

The Ecosystem Team uses this device to catch microorganisms. But it is also used by many other teams. Name of the device:

...Caught something! :)

Looks like we found a single-celled organism under the microscope.

Its scientific name is:



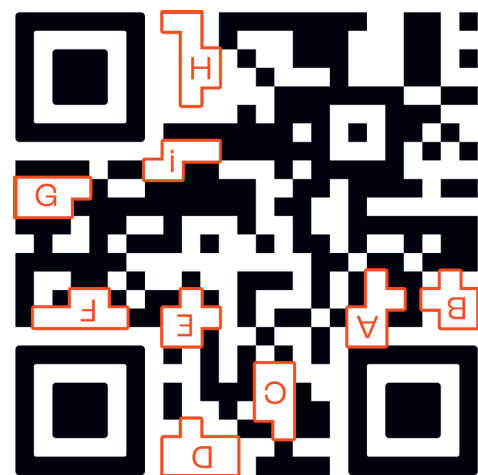
Ready? Go on board and scan your code on the computer! :)

Algae and the Climate

Microalgae are fascinating. And they influence the climate, because...

- G they give off CO₂.
- H they absorb CO₂.
- i they insulate the ice from below.

Which field should we color in?

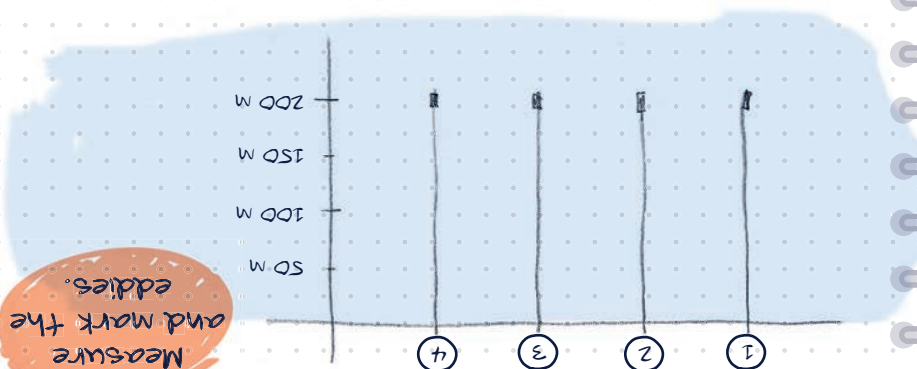


- D carry warm water upward
- E confuse the fish.
- F carry cold water upward

Which part of the QR-code should we color in?

We need to continue to keep a close eye on eddies in the Arctic. Eddies can be a problem for the ice sheet if they...

To DO: Observe Eddies!



Measure and mark the eddies.

We are looking for swirls under water. This is where we found eddies today:

Eddies

Drifting buoy

These buoys have CTD-probes. We use them to measure two different things

Find the buoy

2

TEAM OCEAN

A Research Diary for the exhibition THIN ICE

Deutsches Museum VERKEHRSZENTRUM

Deutsches Technik museum

- A a compass
- B a multitool
- C dog food

Don't forget! We're about to go out on the ice. Let's check our packs one more time. Yikes, we almost forgot something important!

Let's draw our worst-case scenario :)

Scary story! It's soooo dangerous out on the ice. Anything can happen.....

SAFETY

Survival box We have a lot of luggage with us. How do we get the box transported?

Find the box



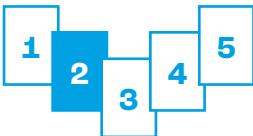
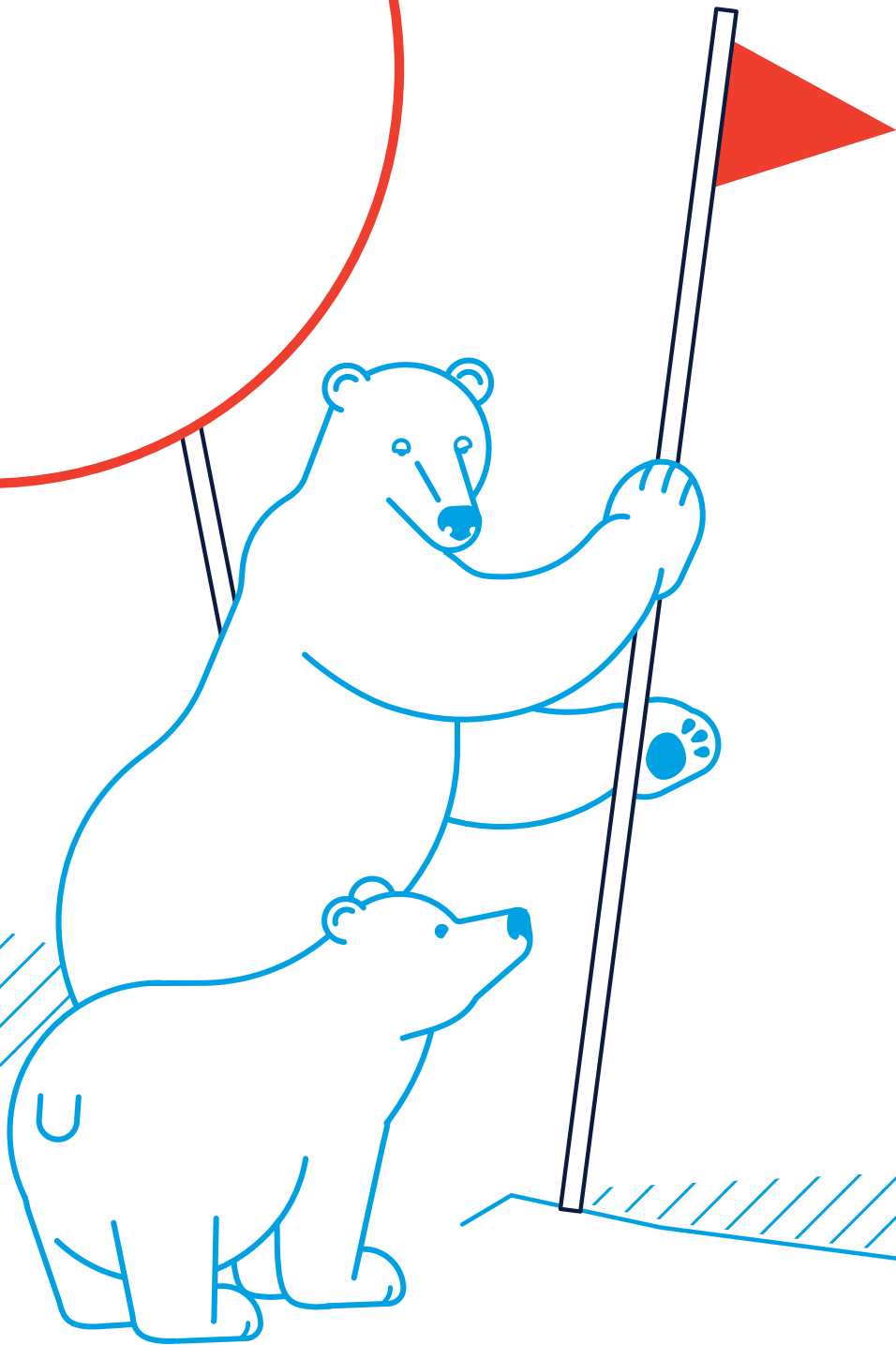
Name(s):
Date: Temperature: 25°C

Our stations:



Scan the coloured code on the climate-computer

This is what
we want from politics:



You can add more
research missions
here.

TEAM ECOSYSTEM

Polar research has shown that the
climate crisis is serious. We have to work
together for change. Let's start!

This is
what we'll do:

Come along on a
climate expedition!

ICE
THIN

FEOSTE

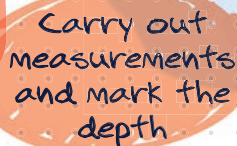


Taking Samples

The Ocean Team is taking water samples. Let's write down the coordinates of the sampling location:

87°, 101°

We are looking for swirls under water. We found the so-called "eddies" here:



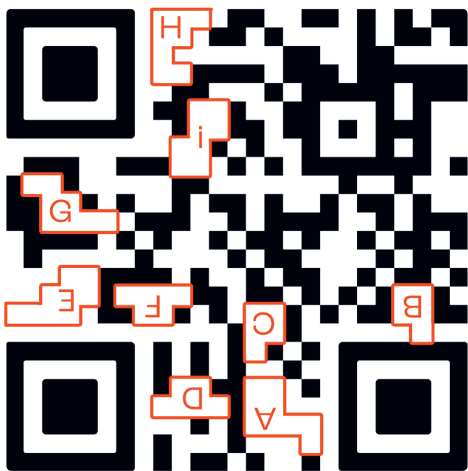
Ready? Go on board and scan your code on the computer! 😊

Layered Water

The temperature difference between the ocean layers is getting increasingly smaller. This could weaken the Gulf Stream. The Gulf Stream is particularly important for Europe. It brings us...

- G cold from the Arctic.
- H heat from the equator.
- i rain from Siberia.

Color in the right part of the QR-code



blemi!

The smallest life forms, like Diatoms, are at risk. This is dangerous because ...

Hmm... Which field do we color in?

D they break down plastics.
E they store lots of CO₂.
F they turn the water blue.

A tiny problem?

which field should we color in?

A is steaming.
B tastes funny.
C is very bright.

You found polar bear poo.
The bear was just here. You can
tell because the pile...

What a mess!

Time to Chill ~
No bears in sight. Now we
have time to look at the
scribbles in the hut.
Something seems wrong
with the photo though...
(Can you find the 6
differences?)



Which one is it?

AAAAaaaaah! Bears!
we are on the lookout with
binoculars. Watch out, something
is moving over by the vehicles!
... phew, we're lucky. It's turning
away.

Find the
Polar Bear
Huti

On the Hunt

for our research today.

We catch:

find the hand net!



Deutsches Museum
VERKEHRSZENTRUM



Deutsches
**Technik
museum**

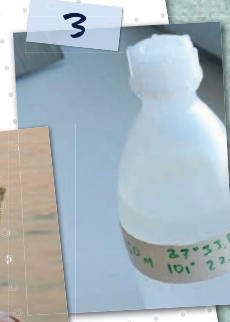
A Research Diary for the
exhibition THIN ICE

TEAM ECOSYSTEM

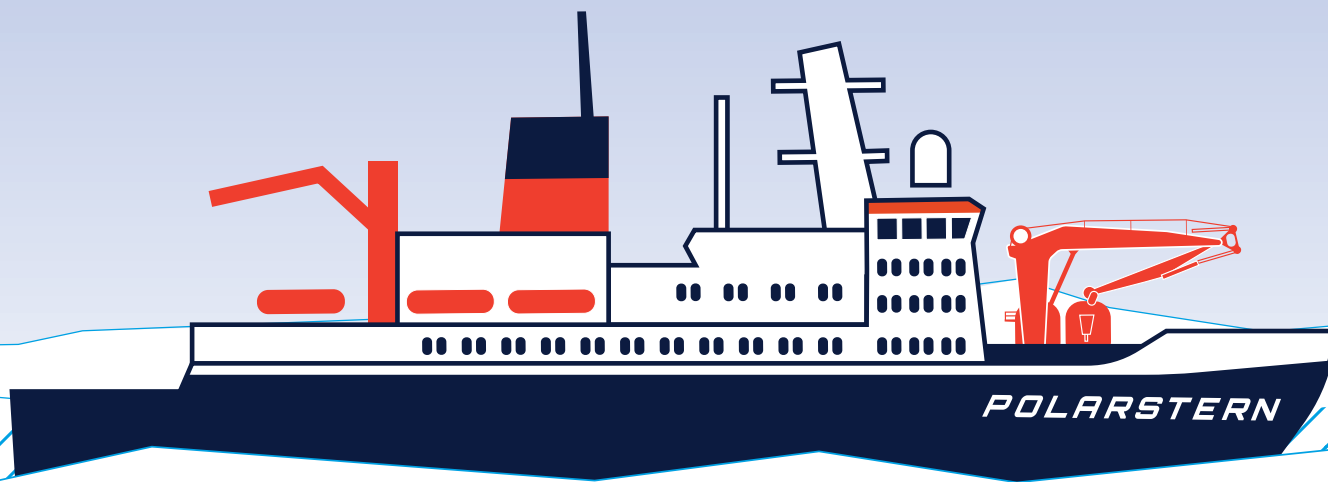
Our team uses microscopes to find out why algae are important for the climate. Ready? Your mission starts NOW

Name(s): Temperature:
Date: 3

our stations:



4  Scan the coloured code on the climate-computer

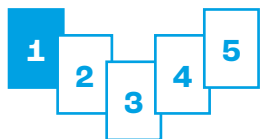


TEAM BIOGEO- CHEMISTRY

Polar research has shown that the climate crisis is serious.
We have to work together for change. Let's start!

This is
what we'll do:

This is what
we want from politics:



You can add more
research missions
here.

Come along on a
climate expedition!

ICE
THIN

ATMOSPHERE



Find the balloon!

3

Walking Miss Piggy

The Atmosphere Team takes Miss Piggy out of her tarp garage. She will take measurements at an altitude of 1,500 meters. Let's help and get the gas cylinder to refill her

18 VIII A	2 4.0026 He Helium
10 VIIIA	10 18.998 Ne Neon
9 VIIA	9 18.998 F Fluor
8 VIA	8 15.999 O Oxygen
7 VA	7 14.007 N Stickstoff
6 IVA	6 12.011 C Kohlenstoff
18 VIII A	18 39.948 Ar Argon
17 VIIA	17 35.453 Cl Chlor
16 VIA	16 32.065 S Schwefel
15 VA	15 30.974 P Phosphor
14 IVA	14 28.086 Si Silicium

- ☐ helium or
- ☐ oxygen?

tick!

Catch cool Particles!

We can use a light radar to detect particles in the air. We use the lamp and search for aerosols. We find this one particularly often:

Sketch:



Name:

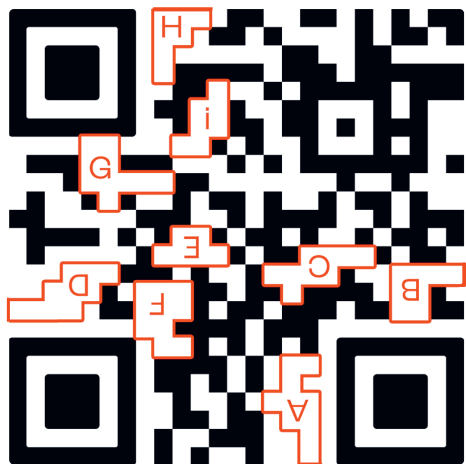
Ready? Go on board and scan your code on the computer! ☺

Living with the Jet Stream!

As the air above the Arctic becomes warmer, the temperature differences around the world become smaller and the jet stream gets weaker. This leads to...

Which field should we color in?

- G worseing internet connection.
- H extreme weather.
- i a decrease in cyclones.



- D it has a much stronger greenhouse effect than CO₂.
- F it turns CO₂ into oxygen.
- E fish need it to breathe.

Actually, we only find small amounts of methane in ice. Yet, it has a big impact on the climate because...

When cows Toof..



Color in the right part of the QR-code

Examining the Ice core sample
While checking the sample for inclusions we have found:

We took an ice core sample right at the North Pole. The position is indicated with coordinates. They are as follows:

Coordinates

Find the ice core sample!



BIOGEOCHEMISTRY

A Research Diary for the exhibition THIN ICE

TEAM

BIOGEO-CHEMISTRY

Our team handles ice core samples and tracks climate-killing gases. Ready? Your mission starts NOW!

Name(s):

Date: Temperature: - 39°C

Our stations:



Scan the coloured code on the climate-computer

Deutsches Museum
VERKEHRSSZENTRUM

Deutsches Technik museum

- A a face mask.
- B a robust pair of jeans.
- C a waterproof rain jacket.

Hmm... which color do we color in?

...only wrong clothes! we definitely need...

There is no such thing as bad weather...

Here is the name of our team, written with polar mitts on:

Don't forget your Mittens!
These mittens are thick! Can we even write with them on?



Safety first
It's icy today! Without our red suit we're not going on the ice. It not only protects us from the cold, it also has other protective functions:

Find the red suit!



CLOTHING