



PRAIRIE
RESEARCH INSTITUTE

NATURALLY ILLINOIS EXPO

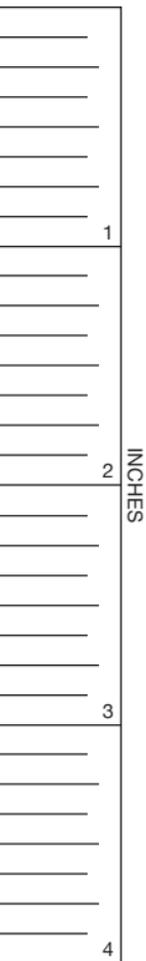
2013
FIELD BOOK

CREW

DATE

WEATHER

COMPLETED



Scientists go to the great outdoors to gather information from the environment. Then they take this information back to their laboratories and offices. A field book is a notebook used by scientists when they are in the field to record measurements, discoveries, and observations.

HOW TO USE THE EXPO FIELD BOOK

As you visit each exhibit, listen to or read the science facts and answer the questions in your fieldbook.

Once your field book is complete, visit the information tent to claim a reward!

1**MOSQUITOES AND DISEASES**

Adult male mosquitoes feed on _____ and female mosquitoes feed on _____ to produce eggs.

- (a) blood and nectar
- (b) blood and blood
- (c) nectar and nectar
- (d) nectar and blood

About how many mosquito species are there in Illinois?

- (a) 20 (c) 60
- (b) 40 (d) 100

2**POLLINATION EXPLORATION:
FROM BUTTERFLIES TO BIRDS**

Which type of pollinator likes to visit stinky-smelling flowers?

- (a) moth (c) bat
- (b) fly (d) bee

Birds like to visit tube-shaped flowers that are what color?

- (a) blue (c) brown
- (b) yellow (d) red

3

CREATURES THAT ARE NOT AFRAID OF THE DARK

What animal with wings might you find living in a cave?

Why do owls have large talons?

4

ALL ABOUT GROUNDWATER AND WATER WELLS

The spaces between sand grains (called pores) allow water to move through the sand.

TRUE FALSE

The screen of a water well keeps sand and other particles out of the well.

TRUE FALSE

5

HOME VENTILATION DEMONSTRATION AND INFRARED PORTRAIT STUDIO

Why do we need ventilation in a building?

What does an infrared (IR) camera see?

6

PRAIRIE RESEARCH INSTITUTE: HOME OF THE STATE SCIENTIFIC SURVEYS

How many Scientific Surveys or Centers are in the Prairie Research Institute?

Name three types of science done by the Prairie Research Institute.

7

ENVIRONMENTAL FATE OF PHARMACEUTICALS & HORMONES AND THEIR UPTAKE BY VEGETABLES

Is it possible for vegetables to grow in water?

YES NO

Can medicine and hormone contaminants collect in plants that are watered with treated sewage wastewater?

YES NO

8

BUGGING THE DINOSAURS: 3D RECONSTRUCTION OF FOSSIL INSECTS

Amber is fossilized _____.

- (a) sap (c) honey
(b) resin (d) plastic

Crickets belong to which order of insects?

- (a) Lepidoptera
(b) Hemiptera
(c) Orthoptera
(d) Hymenoptera

9

PUBLICATION SALES AND TEACHER RESOURCES

Circle the items that are made from geologic resources:

toothpaste glass paper nails kitty litter

Which of these are official state symbols?

- (a) Monarch butterfly
- (b) bluegill
- (c) fluorite
- (d) violet

10

PUTTING PLANTS ONLINE

What is an herbarium?

Why are plants important?

11 ANCIENT GEOLOGIC FACES OF ILLINOIS

Most of the examples in the center two cases contain fossils of organisms that lived in shallow, subtropical ocean environments. Which environment is the most frequently represented?

- (a) Cambrian mud flats
- (b) Silurian coral reefs
- (c) Devonian deltas

Displayed in the leftmost case are rock cores from various Illinois counties. Which of these rock samples was retrieved from the deepest borehole?

- (a) Ordovician dolomite from Macon County
- (b) Precambrian granite
- (c) Cambrian sandstone

12 ILLINOIS MINERALS

What are the major resources found in Pope County? Circle all that are found.

- (a) sand and gravel
- (b) oil
- (c) lead
- (d) fluorspar
- (e) stone
- (f) zinc

What are some of the commercial products that use the above minerals? Circle all that apply.

- (a) auto batteries, solder, radiation shielding
- (b) chemicals, fluoride for toothpaste
- (c) brass and bronze, plating metals

13

INSECTS

What do you call a bug with 6 legs?

What do you call a bug with 8 legs?

14

BUILD ILLINOIS

The muddy, forested delta in ancient Illinois produced what valuable natural resource?

- (a) water (c) coal
(b) iron (d) oil

What major geologic process completely rearranged and rebuilt the landscape of Illinois in the last 2 million years?

- (a) earthquakes (c) volcanoes
(b) glaciers (d) tropical ocean

15

LiDAR: REVEALING ILLINOIS' HIDDEN LANDSCAPES

What sort of instrument is used to acquire LiDAR?

List two examples of "hidden" features that are revealed on LiDAR elevation maps.

16

FUN WITH GASES, LIQUIDS, AND SOLIDS

What is the temperature of liquid nitrogen?

Does cold air rise or sink?

17

EARTHQUAKES, THEN AND NOW

Do earthquakes occur in Illinois?

YES NO

What should you do during an earthquake?

18

THE MANY WONDERS OF CARBON DIOXIDE

Plants require water, sunlight, and _____ for photosynthesis.

Levels of carbon dioxide in the atmosphere are higher now than they were 100 years ago.

TRUE FALSE

19

WATER FLOWS THROUGH CONCRETE

Where does the water go when it rains on your grass?

Where does the water go when it rains on a parking lot?

20

ZERO WASTE INITIATIVE

What is recycling?

Why is it important to recycle?

21

MAKING CLEAN WATER USING MEMBRANES

Can you drink sea water?

YES NO

Do you think the fresh water on earth will one day be used up?

YES NO

22

WATER CORROSION AND SCALE

When you look at water, can you see the minerals in it?

YES NO

Can water dissolve metal pipes?

YES NO

23

SUSTAINABLE ELECTRONICS: DEFINING THE PROBLEM, CONSIDERING SOLUTIONS

Electronic waste such as discarded TVs, digital cameras, printers, and cell phones can contain both toxic and precious materials such as lead, mercury, gold, or silver.

TRUE FALSE

In Illinois, it is against the law to put an old computer or TV into the trash.

TRUE FALSE

24

RIVER OTTERS IN ILLINOIS

Name two ways you can tell a river otter is a mammal.

What do river otters eat?

25

KID'S FOSSIL AND MINERAL DIG

What is the main mineral that geodes are made of?

How old are the fossil plants?

26

COMPRESSED NATURAL GAS (CNG)/METHANE CONVERSION TO BIODIESEL RESEARCH

Where does natural gas come from, and what country has the biggest supply in the world?

What are the advantages of converting compressed natural gas (CMG) to biodiesel?

27 WASTE PLASTICS TO OILS

Waste plastics/used tires can be converted into fuels.

TRUE FALSE

List five plastic wastes generated in your homes that can be converted into fuels.

28 SUPERCAPACITORS FOR
ENERGY STORAGE AND WATER PURIFICATION

Which of the following is the advantage of supercapacitors over batteries?

- (a) fast charging and discharging
- (b) high specific energy and power

Why are supercapacitors used in electric vehicles?

- (a) To provide instant power.
- (b) To provide constant power.

29

WETLAND WONDERS

Plants that are adapted to living in saturated conditions are called _____.

Soils found in wet areas are called _____.

30

GREENING SCHOOL GROUNDS: CREATING HABITATS FOR LEARNING

Before European settlement, the majority of habitat in this area used to be what kind?

How much original prairie is estimated to be left in Illinois?

31

WHAT'S IN A WETLAND

What can you learn from a well?

Where do we find wetlands in Illinois?

32

THE ISAS EAST CENTRAL ILLINOIS ARCHAEOLOGICAL PROJECT

East Central Illinois contains important prehistoric Indian artifacts such as arrowheads and grooved axes.

TRUE FALSE

East Central Illinois has yielded artifacts that are thousands of years old.

TRUE FALSE

33

ARCHAEOLOGY IN ILLINOIS: ROCKS, BONES, POTS, AND PEOPLE

What kinds of artifacts do archaeologists find when they are digging at an archaeological site?

- (a) animal bones
- (b) broken dishes
- (c) burned wood
- (d) stone tools
- (e) all of the above

Did Native Americans live in Illinois before the European settlers moved here?

YES NO

34

THE IMPORTANCE OF POTTERY IN THE ARCHAEOLOGICAL RECORD

Can you date archaeological sites based on the pottery found there?

YES NO

What kind of tools were used to decorate prehistoric pottery?

- (a) shells
- (b) cord
- (c) sticks
- (d) pebbles
- (e) all of the above

35 FLINTKNAPPING DEMONSTRATION

What is flintknapping?

- (a) an ancient method of making tools using stone
- (b) a way to make baskets out of grass
- (c) a way to cook corn in an underground oven
- (d) traveling along a river in a canoe

Native Americans who lived in Illinois during ancient times got all of their supplies for hunting, cooking, celebrating, making clothes, playing games, and building houses from nature.

TRUE FALSE

36 PRAIRIE PLANTS PLOT

What insect likes to live on milkweed?

The honey bee likes to gather pollen from what plant?

37

FLOODPLAIN SIMULATION SYSTEM

What natural disaster causes the most damage in the state of Illinois?

A large hurricane caused billions of dollars in damages in 2012 when it hit the northeastern coast of the U.S. including New York City. What was the name of this storm?

38

WHAT'S FOR DINNER?

EATING PLANTS THROUGH THE AGES IN ILLINOIS

Squash was used as a food and as a tool.

TRUE FALSE

Has corn always grown in Illinois?

YES NO

39

DID THEY REALLY EAT LIKE THAT? FRONTIER FOODWAYS IN ILLINOIS

What choice below most closely resembles a frontier meal?

- | | |
|--|---------------------|
| (a) Big Mac with fries | (c) mud pies |
| (b) bacon and greens
with apple dumplings | (d) pepperoni pizza |

Which of these can be found in both a frontier kitchen and your kitchen? Choose all correct answers.

- | | |
|----------------------|-------------------|
| (a) microwave | (d) cast iron pot |
| (b) table and chairs | (e) chopsticks |
| (c) electric stove | (f) mixing bowl |

40

MEASURING THE WEATHER: HOW HOT IS IT OUTSIDE?

A thermometer is used to measure wind speed.

TRUE FALSE

What do you use to measure how much it rained?

41

MAKE YOUR OWN RAIN GAUGE AND DISCOVER MORE HOW-TO'S

What instrument is used to measure the amount of rainfall?

- (a) thermometer
- (b) rain gauge
- (c) rain board
- (d) anemometer

The best place to put a rain gauge is right next to your house.

TRUE FALSE

42

MILE-HIGH-ICE? ONCE UPON A TIME IN ILLINOIS

Match the glacial material seen in the samples to the geologic agent that deposited it.

- | | |
|---------------------|-----------------|
| (1) silt | (a) glacial ice |
| (2) till | (b) melt water |
| (3) sand and gravel | (c) wind |

Match the landform found in Illinois to the glacial agent that produced it.

- | | |
|-------------------|--|
| (1) moraine | (a) water that melted from the glacier |
| (2) outwash plain | (b) glacial ice |
| (3) loess bluff | (c) wind storms |

43 COAL IN ILLINOIS

How much coal is left in Illinois?

How does coal form?

44 HYDRAULIC FRACTURING
TO PRODUCE OIL AND GAS IN ILLINOIS

How is oil trapped underground?

Why do we "frack" the rock?

45 FUN WITH WATER CHEMISTRY

Water with a pH of 4.0 is _____.

- (a) basic
- (b) neutral
- (c) acidic

The word "polymer" means many what?

- (a) units
- (b) colors
- (c) flavors

46 ILLINOIS AMERICAN WATER

Where does Champaign's drinking water come from?

How is drinking water delivered to your home?

47

TRAVELING SCIENCE CENTER: ILLINOIS BIODIVERSITY

What is one way you can help prevent the spread of exotic species?

What group of living things has the most species (different kinds?)

48

LEARNING ABOUT BICYCLES AND RIDING THEM A LOT

What are the two types of valves to let air in and out of bicycle tubes?

If your tires are flat, should you ride on them?

Why do people run?

If I run 5 kilometers (5km,) how many miles will I run?

NOTES

NOTES

NOTES

CENTIMETERS





PRAIRIE

RESEARCH INSTITUTE

HOME OF THE ILLINOIS STATE SCIENTIFIC SURVEYS

Illinois Natural History Survey
Illinois State Archaeological Survey
Illinois State Geological Survey
Illinois State Water Survey
Illinois Sustainable Technology Center

For over 150 years the Scientific Surveys have applied cutting-edge science for the people of Illinois, to build their economy, promote public health and safety, and steward their abundant resources.

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