

Lesson 6 Part 2

A COLLECTION OR FIELD GUIDE:

CAUSE AND EFFECT

CAUSE AND EFFECT

- Events have causes. We can think of nature as a world full of mysteries, or “effects,” and try to explain what might have caused what we see. Cause and effect relationships may be used to predict events.
- In scientific practice, deducing the cause of an effect is often difficult, so multiple hypotheses may coexist. (Think about the different hypotheses about the extinction of dinosaurs – a meteor, climate change, starvation and more.)
- Cause and Effect can be answered with COULD IT BE... hypotheses.

How to Study Cause and Effect

- As yourself these questions when you are doing an observation:
 - What happened here?
 - What caused this to happen?
 - How might you explain that?
 - What are other possible explanations?
 - Why is it like that?
 - What would happen if...?
 - How does this affect other things?





Examples of Evidence of Cause and Effect

- Things impacted or shaped by water
- Signs of fall
- Things affected by wind
- Things that snow does
- Shapes of icicles
- Evidence of drought
- Things that are broken
- Things that are soft
- Things with strong odor
- Things attracted to porch lights at night
- Signs of the season

Your Turn

1. Make a field guide of your chosen subject that shows CAUSE AND EFFECT.
2. Include three to five things in your field guide.
3. Arrange the page so that you show a drawing with words and numbers next to it.
4. Record observations with words, pictures, and numbers, paying attention to similarities and differences and evidence of CAUSE AND EFFECT.



Remember to begin with your metadata



Date, Day, Time



Location, habitat



Weather

Temperature

Wind

% Cloud cover

Plan your page



Heading first
Then Title



If you're studying three objects, create enough space for all three things.
(Consider using two pages.)



Remember to include ABC's, 123's and drawing/sketch/diagram.



Use the next page for your reflection questions/paragraph.

One Additional Thing:

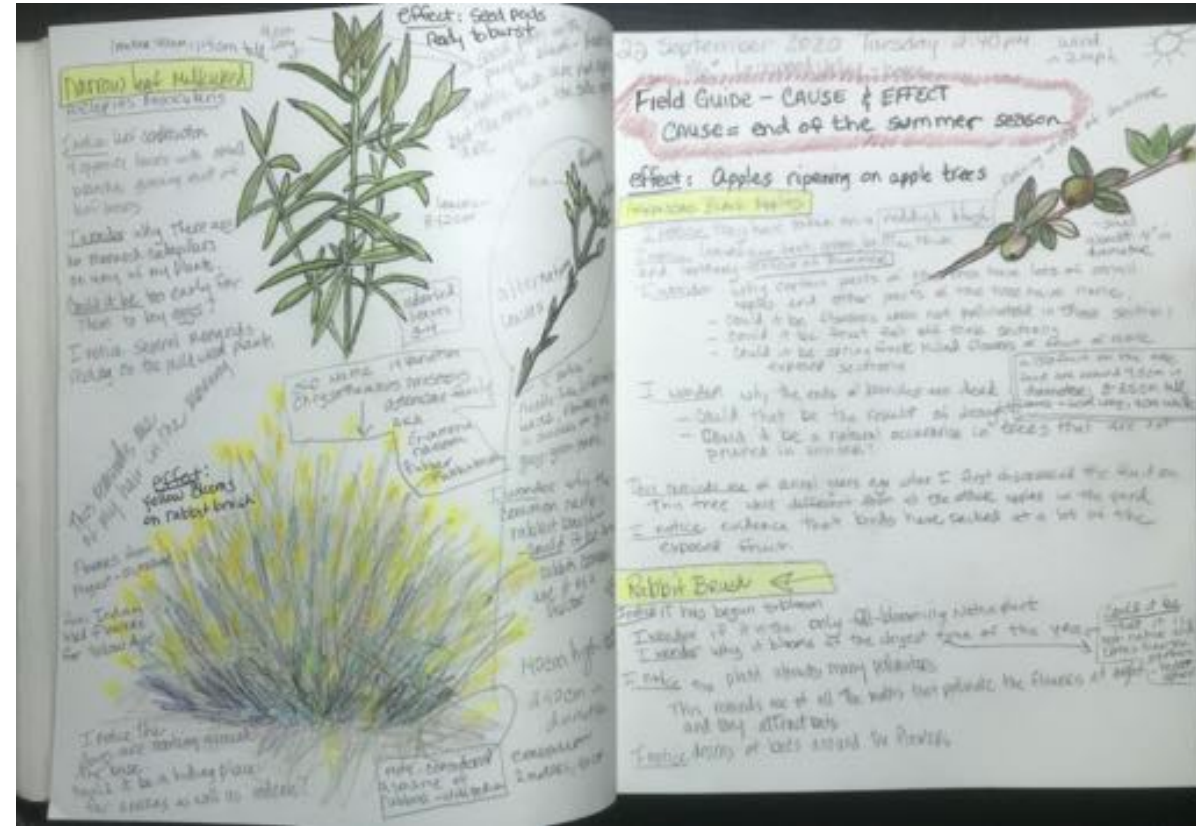
For each “I wonder...”

**Write one or two hypotheses by
completing the sentence frame:**

“Could it be...”

Plan your layout the way you want it.

- Here's mine:
 - 3 sections using both pages
 - Lots of measurements (123's)
 - Each subject treated the same way
 - Name of plant
 - Measurements
 - I notice, I wonder, this reminds me of
 - COULD IT BE... for each "I wonder"



Narrow leaf Milkweed

Asclepias fascicularis

Leaves are opposite
opposite leaves with small
points, growing out of
leaf bases

Leaves why there are
so many at my plant.

Should it be too early for
them to lay eggs?

I notice several monarchs
visiting the milkweed plants.

Also noticed that
at my plant in the morning

effect:
yellow blooms
on rabbit brush

Flowers are
purple-orange

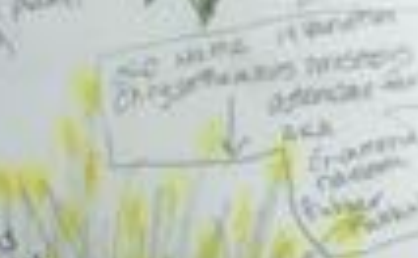
from Indian
red flowers
for yellow light

I notice that
they are starting to wilt

the tree
should it be a hiding place
for insects as well as others?

note: considered
hiding place of
rabbits - all kinds

140cm high
40cm in
diameter
conspicuous
leaves, etc



Really to burst
with
purple
leaves
2nd/3rd years in the 5th
year

alternating
leaves
1st year
leaves 3-4
no more flowers
Chrysanthemum
alternans
and
Erigeron
racemosus
Pursh

I wonder why the
leaves are so
many at my plant

Should it be
too early for
them to lay eggs?

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140cm high
40cm in
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conspicuous
leaves, etc

23 September 2020 Tuesday 2:40 PM wind
2 mph

Field Guide - CAUSE & EFFECT

Cause = end of the summer season

effect: Apples ripening on apple trees

Important Data Points

1. Notice that the leaves are reddish-brown
2. Notice that the leaves are not green
3. Notice that the leaves are not green

4. Notice that the leaves are not green
5. Notice that the leaves are not green

6. Notice that the leaves are not green
7. Notice that the leaves are not green

8. Notice that the leaves are not green
9. Notice that the leaves are not green

10. Notice that the leaves are not green
11. Notice that the leaves are not green

12. Notice that the leaves are not green
13. Notice that the leaves are not green

14. Notice that the leaves are not green
15. Notice that the leaves are not green

16. Notice that the leaves are not green
17. Notice that the leaves are not green

18. Notice that the leaves are not green
19. Notice that the leaves are not green



Should it be
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140cm high
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22 September 2020 Tuesday 2:40 PM Wind ~2mph 

81° Lockwood Hills - home

Field Guide - CAUSE & EFFECT

CAUSE = end of the summer season

effect: Apples ripening on apple trees

ANANAS Black Apples

I notice they have taken on a reddish bluish

I notice leaves are dark green brittle, thick and leathery - effect of summer

I wonder why certain parts of the tree have lots of small apples and other parts of the tree have none.

- Could it be flowers were not pollinated in those sections
- Could it be fruit fell off those sections
- Could it be spring frost killed flowers or fruit of more exposed sections.

I wonder why the ends of branches are dead.

- Could that be the result of drought
- Could it be a natural occurrence in trees that are not pruned in winter?

This reminds me of several years ago when I first discovered the fruit on this tree were different from all the other apples in the yard

I notice evidence that birds have pecked at a lot of the exposed fruit.

Rabbit Brush ←

I notice it has begun to bloom

I wonder if it is the only fall-blooming native plant

I wonder why it blooms at the driest time of the year

I notice the plant attracts many pollinators

This reminds me of all the moths that pollinate the flowers at night and they attract bats.

I notice dozens of bees around the flowers

~150 fruit on the tree
Fruit are around 4.5cm in diameter, 3-3.5cm tall
Leaves ~6cm long, 4cm wide

Could it be that it is not native and comes from the southern hemisphere

Notice:

*Metadata

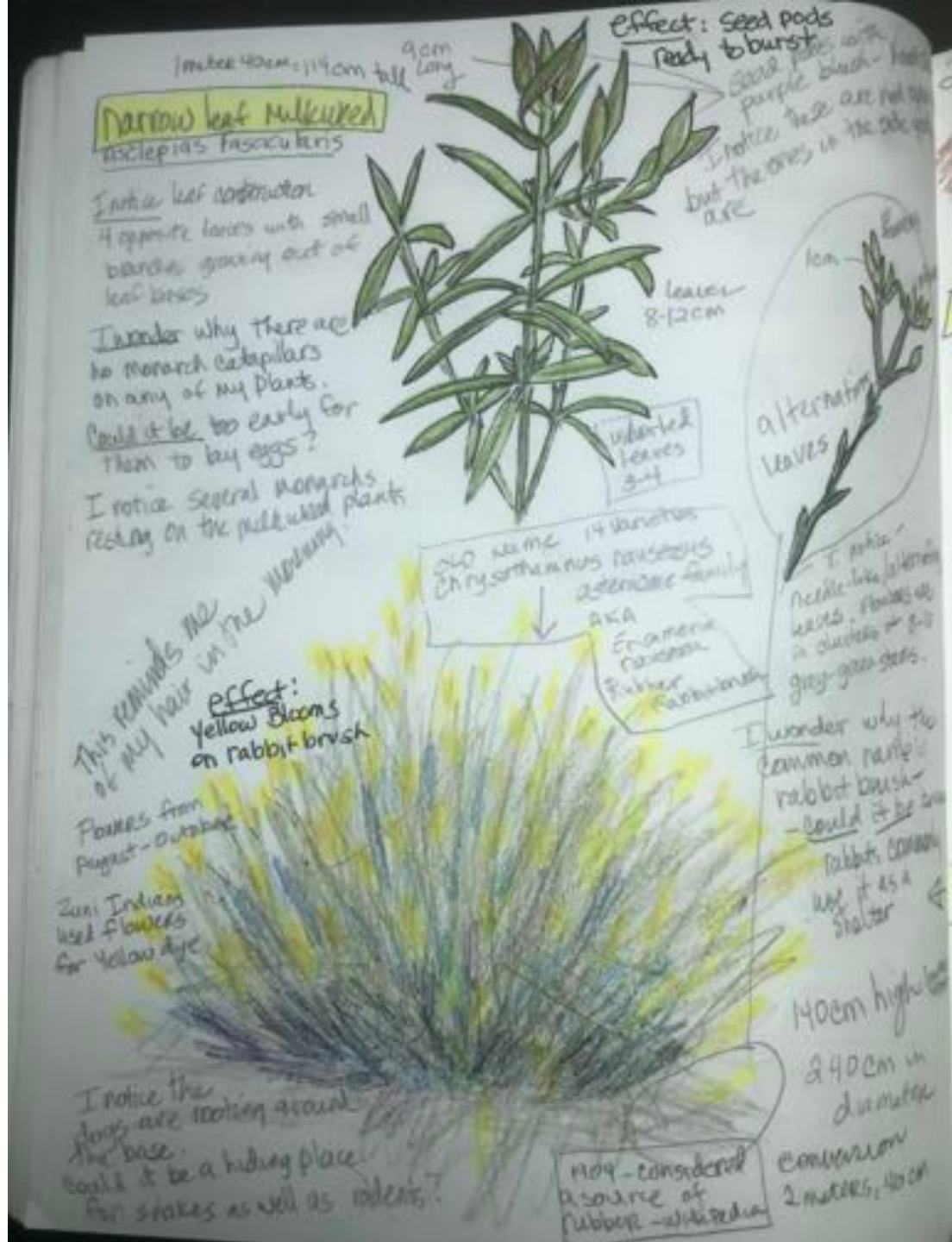
*Title - I even gave the cause a name:
"end of the summer season"

*I mentioned the effect of the cause
then began my journal study

Because I wrote more about the apple than I had planned, I began to study Rabbit Brush under it, thinking I would do a smaller drawing, but again, ran out of room, so...

I moved over to the opposite page and continued to draw the rabbit brush and write more things at the bottom, directly across from where I started.

Then I did my third study (milkweed) above it. So I sort of created my page in a clock-wise circle.



Narrow leaf Milkweed

Asclepias fascicularis

Notice leaf construction
4 opposite leaves with small
branches growing out of
leaf bases

I wonder why there are
no monarch caterpillars
on any of my plants.
Could it be too early for
them to lay eggs?

I notice several monarchs
resting on the milkweed plants

This reminds me
of my hair in the morning

Effect:
Yellow Blooms
on rabbit brush

Flowers from
Pugnut - Oxbow

Zuni Indians
used flowers
for yellow dye

I notice the
leaves are looking around
the base.
Could it be a hiding place
for snakes as well as ants?

Effect: Seed pods
Ready to burst

Seed pods with
purple bluish - hairy
I notice these are not
but the ones in the side
are

leaves
8-12 cm

undulated
leaves
3-4

old name 14 varieties
Chrysanthemum leucanthemum
asteraceae family
AKA
Erigeron
Rabbit
brush

alternating
leaves

I notice
needle-like alternate
leaves. Flowers are
in clusters - 5-8
grey-green stems.

I wonder why the
common name
rabbit brush -
could it be the
rabbit's common
use it as a
shelter

140cm high

240cm in
diameter

conversion
2 meters, 40cm

1104 - considered
a source of
rabbit - antelope

Now do your
own field
guide.
Focus on
**CAUSE AND
EFFECT**



Take 45 minutes to 1 hour to
work on all your studies (3-5).



Come back and do your
reflection questions on your
next page.

Question/Answer	Answer	Begin	End
Question/Answer form (Put as many words from the question into your answer.)	Answer all questions, then put them in an order that makes sense for a paragraph.	Begin with a topic sentence ("I created a field guide focusing on CAUSE AND EFFECT.")	End with a closing sentence ("It was interesting to hypothesize about the causes and effects of my subjects.")

REFLECTION



REFLECTION QUESTIONS

- What are some features that all of the things you studied share?
- How might you describe this category of things in general?
- What were some of the differences between the subjects in your field guide?
- What are some possible explanations for why these features occur? (These are the “COULD IT BE...” statements.)
 - (You need to include AT LEAST two hypotheses. The more you include, the more you’re thinking like a scientist!)
- If you made a field guide to evidence an effect, what can you say about how that effect is impacting this place? (For example, if you did it on evidence of drought, how is drought impacting the habitat?)



Looking Forward

Next time, we'll
create a field guide
focused on **Systems
and System Models.**

Start looking around
for interesting
subjects.

BYE FOR NOW.

THANKS FOR
JOINING ME.



Tejon Ranch
CONSERVANCY

