



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

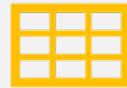
Plan your page



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:

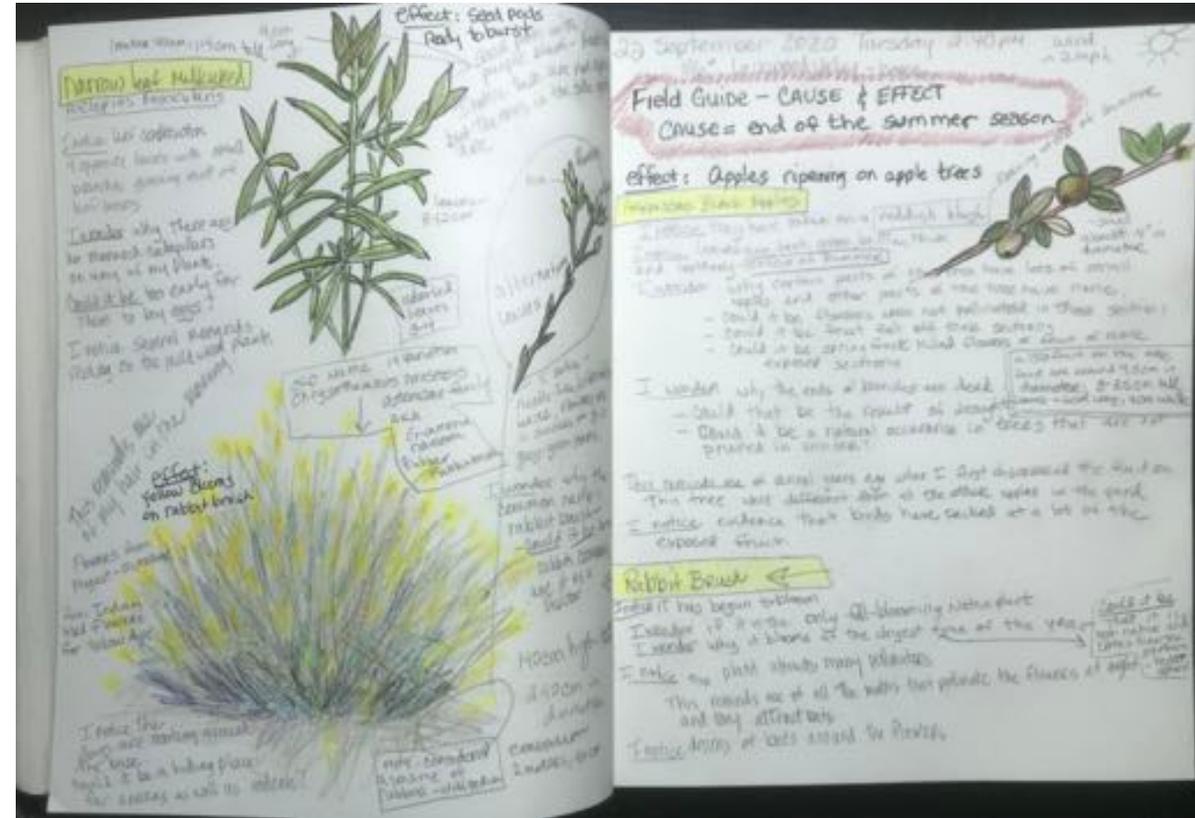
For each “I wonder...”

**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
I spotted leaves with small
white flowers on the
leaf bases

Leaves why there are
to attract caterpillars
to eat of my plants.

Should it be too early for
them to lay eggs?

I notice several monarchs
visiting to the milkweed plants.

They already lay
at my place in the morning
Effect:
Yellow Blooms
on Rabbit brush

Flowers are
fragrant - orange

from Indian
red flowers
for yellow light

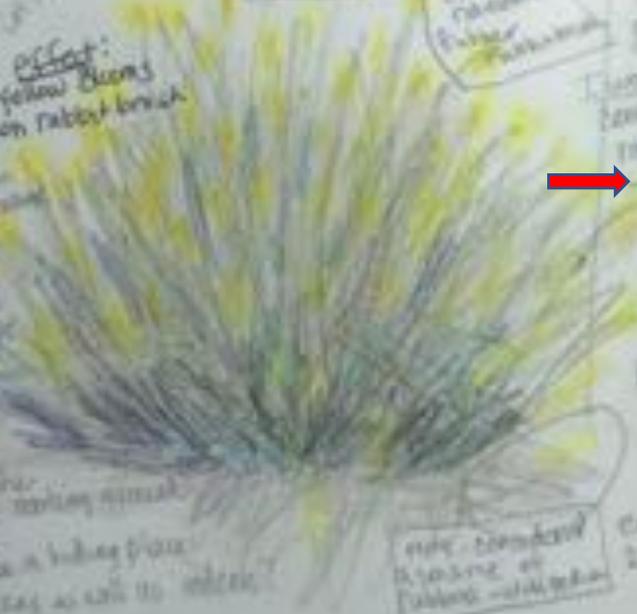
I notice the
leaves are turning orange
the base
Should it be a warning sign
for caterpillars as well as bees?



NO NAME - I wonder
if this is the same
as the one I saw
at the garden
I wonder why the
leaves are turning
orange - yellow
Should it be a
warning sign
for caterpillars
as well as bees?



I wonder why the
leaves are turning
orange - yellow
Should it be a
warning sign
for caterpillars
as well as bees?



140cm high
at 40cm in
diameter
Common
leaves are
orange

Ruby tobacco

23 September 2020 Tuesday 2:40 PM wind
= 2 mph

Field Guide - CAUSE & EFFECT
Cause = end of the summer season

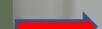
Effect: Apples ripening on apple trees

I wonder why the ends of branches are dead
Should that be the result of drought?
Should it be a natural occurrence in trees that are not
pruned in winter?

This reminds me of some years ago when I kept discovering the dead on
This tree with different dead at the other side in the yard
I notice evidence that birds have nested at a lot of the
exposed fruit.

Rabbit Brush

Should it have begun to bloom
I wonder why it blooms only all blooming here first
I wonder why it blooms at the dryest time of the year
I notice the plants already many visitations
This reminds me of all the water that plants the flowers at night
and they attract bees
Fruiting mostly at base around the plants



22 September 2020 Tuesday 2:40 PM Wind ~2mph 
86° Lockwood Hillery - home

Field Guide - CAUSE & EFFECT

CAUSE = end of the summer season

Effect: Apples ripening on apple trees

ANNAS Black Apples

Notice they have taken on a reddish bluish color.  - small about 4" in diameter
Notice leaves are dark green brittle, thick. - effect of summer
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?

A 150 fruit on the tree
fruit are round 4.5cm in diameter, 3-3.5cm tall
leaves - 6cm long, 4cm wide

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 ←

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.
Notice dozens of bees around the flowers

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

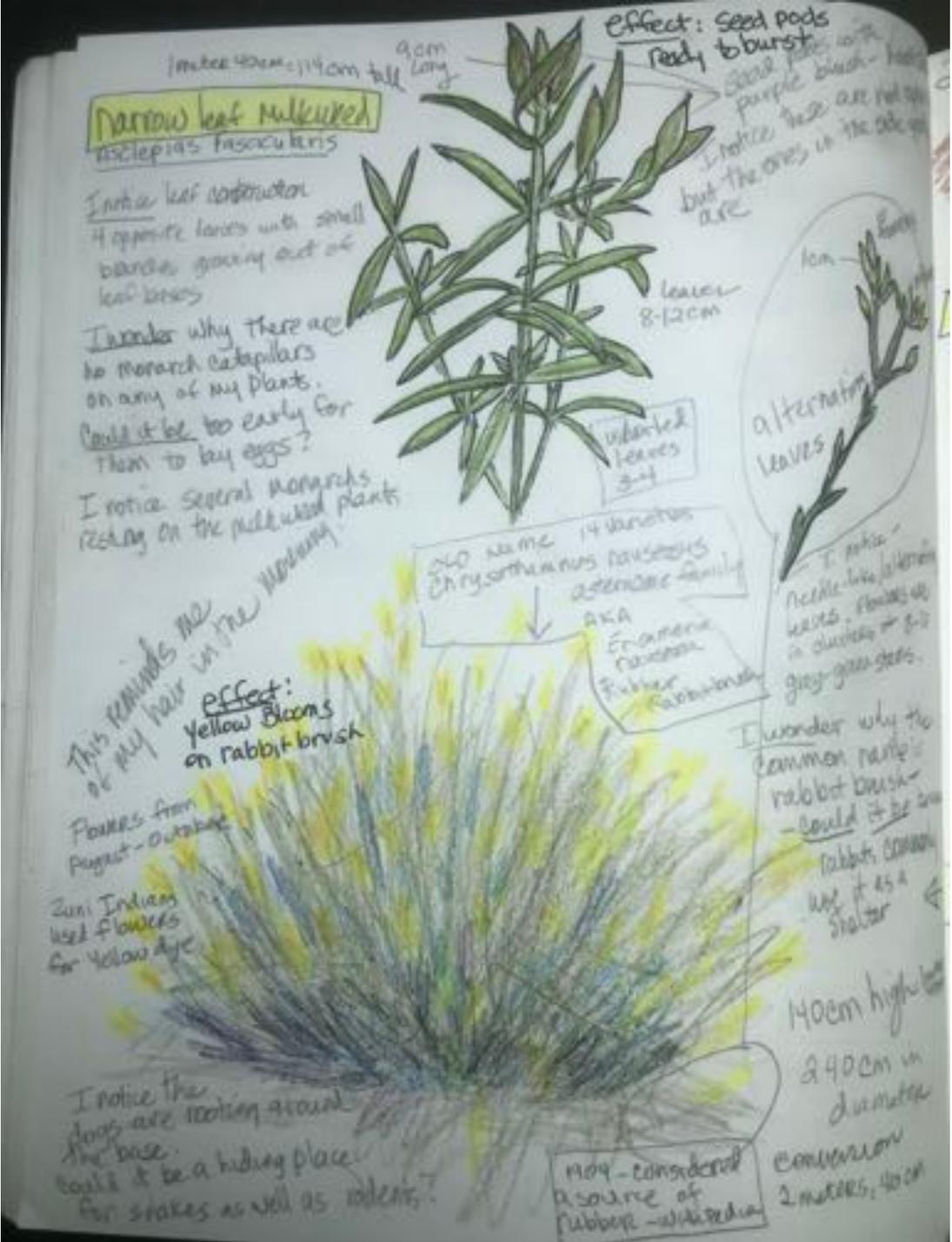
Notice:

- *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.



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

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

