



The Seed
Pile Project's

Seedling Guide

RIVER DISTRICT





Seedling identification

Cotyledons

The first leaves that appear when a seed germinates are called cotyledons. These special leaves are actually part of the plant embryo inside the seed! Cotyledons are often different than true leaves, but they still have distinctive shapes.

seed before germination*



seed coat reveals cotyledons and root grows down into soil



seed coat gone and stem emerges between the two cotyledons



*This is a spaghetti squash seed, much bigger than the seeds in the Seed Pile Project!



Seedling identification

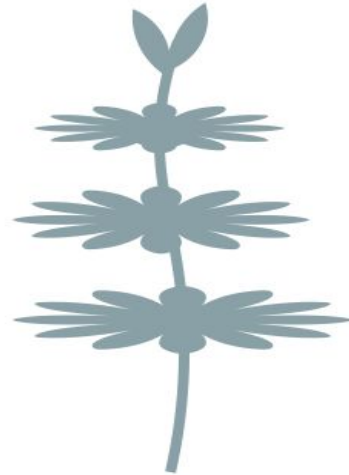
Common leaf arrangements



Alternate



Opposite



Whorled



Seedling identification

Leaf edges & types



Smooth



*Toothed/
serrated*



Lobed



Palmate



Pinnate

Simple leaves

Compound leaves



Things to remember before you start...



- **Tons of tiny green sprouts?** Don't be overwhelmed! We only need count estimates, so try and get your best guess.
- **Zero sprouts at all?** That's OK! "No data" gives us just as much information as lots of sprout data.
- **Seeds germinate** (begin to grow into a plant) based on environmental cues; meaning, they feel the world around them and wait for the right time to start growing. These seeds will be looking for a cold and wet period, so expect more sprouts after the next big rain.
- **Can't tell the plants apart?** Just give it your best guess -- it will get easier as the plants grow and produce more true leaves and flowers.
- **Can't tell the seed pile plants from weeds or other sprouts?** We totally get it... it's not always easy for us either! Just try your best and check the "None, or none that I could tell" box if needed.



Instructions

Continue monthly observations using the Seed Pile Project Google form (or paper form, if preferred):

1. Wait **one week or longer** to collect seedling data after dropping your seed pile.
2. Follow the link to open the Google form.
3. Look around in a **5 foot radius** (5 feet is about two small adult steps; one tall kid or short adult lying on the ground; or the length of a park bench). **Estimate** how many seedlings you see of the specified plant species (none, 1-10, 11+).

Choose the most common **growth stage** you see (seedling, flowering, set seed).

4. **Repeat** for each of the seed pile species. This should take ~15 minutes. It will go even quicker as you become familiar with the plants and as fewer seedlings make it to maturity.
5. Make sure to **record** your observation by selecting “submit” when you have answered all the questions.



Common Yarrow, *Achillea millefolium*



Cotyledons:

- Smooth & oval
- Fall away quickly for toothy true leaves



© Miridae



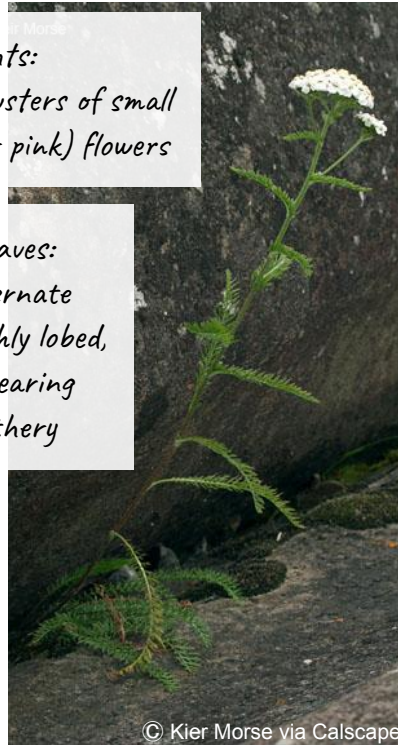
© Miridae

Mature plants:

- Dense clusters of small white (or pink) flowers

True leaves:

- Alternate
- Highly lobed, appearing feathery



© Kier Morse via CalScape



© Pentham via CalScape



© Sierra Pacific Industries via CalScape



Common Yarrow, *Achillea millefolium*



© Pentham via Calscape

Mature plants:

- *Dense clusters of small white (or pink) flowers*



© Zoya Akulova
2015 via Calscape



After flowering:

- *Petals drop*
- *Remaining seed head is golden colored*
- *Tiny seeds fall when shaken*



Elegant clarkia, *Clarkia unguiculata*



Cotyledons:

- Smooth
- Pink midrib

© 2013 Neal Kramer via Calscape

Leaves:

- Opposite at base
- Occasional narrow, alternate leaves



© 2013 Barry Breckling via Calscape

Flowers:

- Pink/purple
- Four petals
- Slender
- Triangular



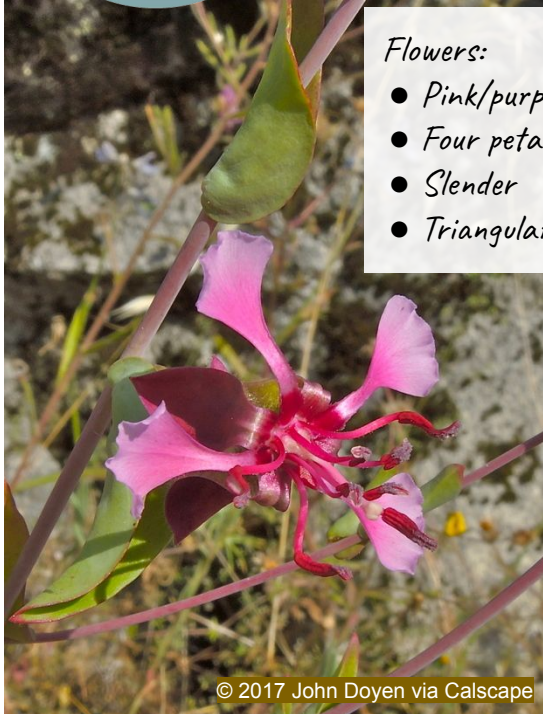
© 2017 John Doyen via Calscape



Elegant clarkia, *Clarkia unguiculata*

Flowers:

- Pink/purple
- Four petals
- Slender
- Triangular



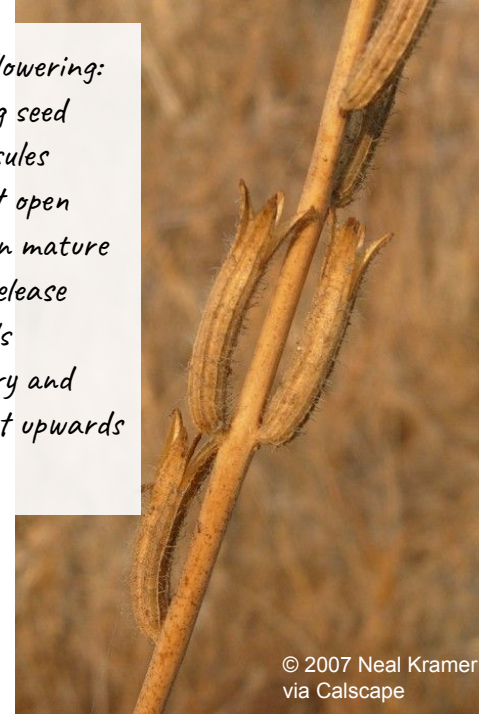
© 2017 John Doyen via Calscape



© 2014 Steve Matson via Calscape

After flowering:

- Long seed capsules
- Split open when mature to release seeds
- Hairy and point upwards



© 2007 Neal Kramer
via Calscape



California poppy, *Eschscholzia californica* (young)



Cotyledons:

- Straight/smooth
- Forked (bifid)
- Bright green



Leaves:

- Blue-green
- Alternate
- Highly lobed (fingers)





California poppy, *Eschscholzia californica* (mature)



Mature plants:

- *In mounds*
- *Bright orange/yellow four-petaled flowers*

© Miridae



© Kier Morse 2008
via Calscape

After flowering:

- *Petals drop*
- *Seed pod (plant ovary/pistil in center of petals) grows*
- *When mature and browning, seed pod explodes, scattering seeds!*



© Zoya Akulova
2011 via Calscape



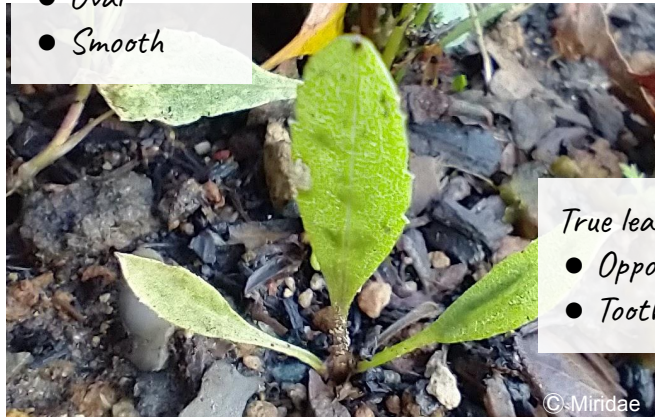
Great valley gumweed, *Grindelia camporum*



Cotyledons:

- Oval
- Smooth

© Miridae



True leaves:

- Opposite
- Toothed

© Miridae



© Miridae



Flowers:

- Yellow
- Solitary or loosely clustered on stalk
- On a spikey head



Great valley gumweed, *Grindelia camporum*

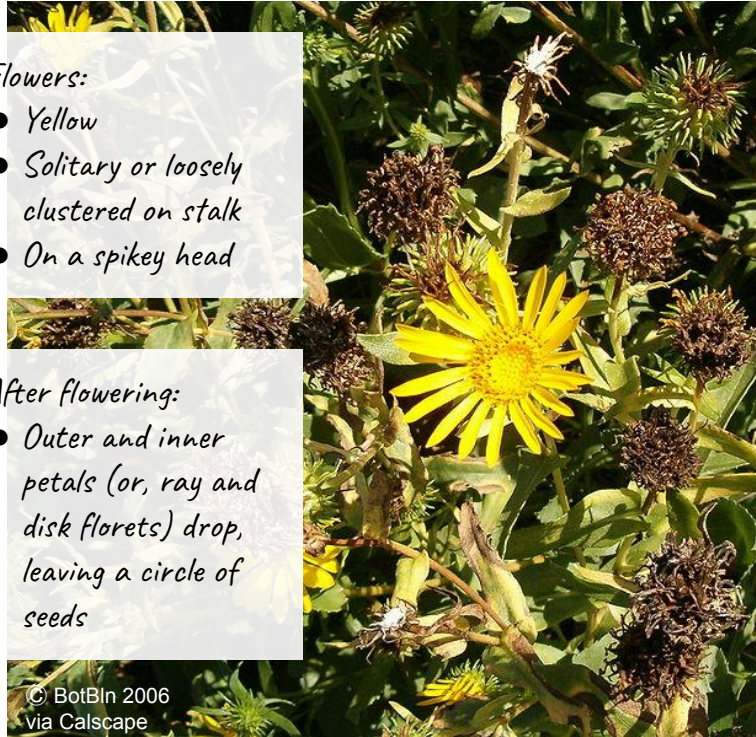


Flowers:

- Yellow
- Solitary or loosely clustered on stalk
- On a spikey head

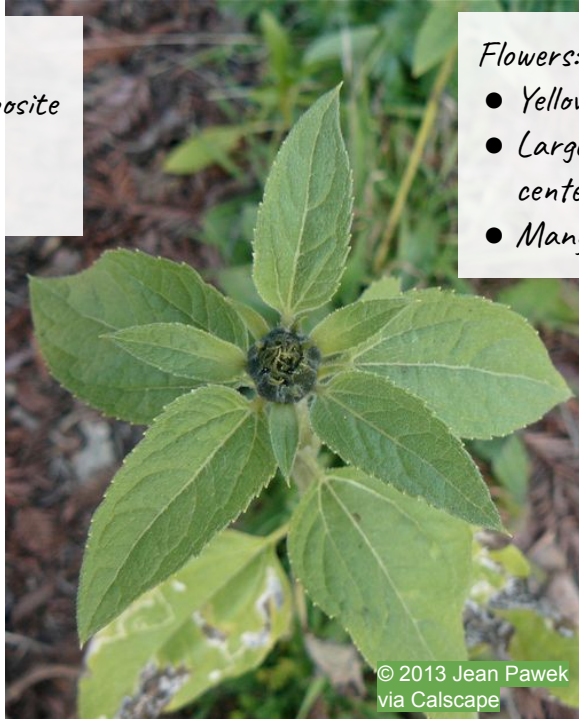
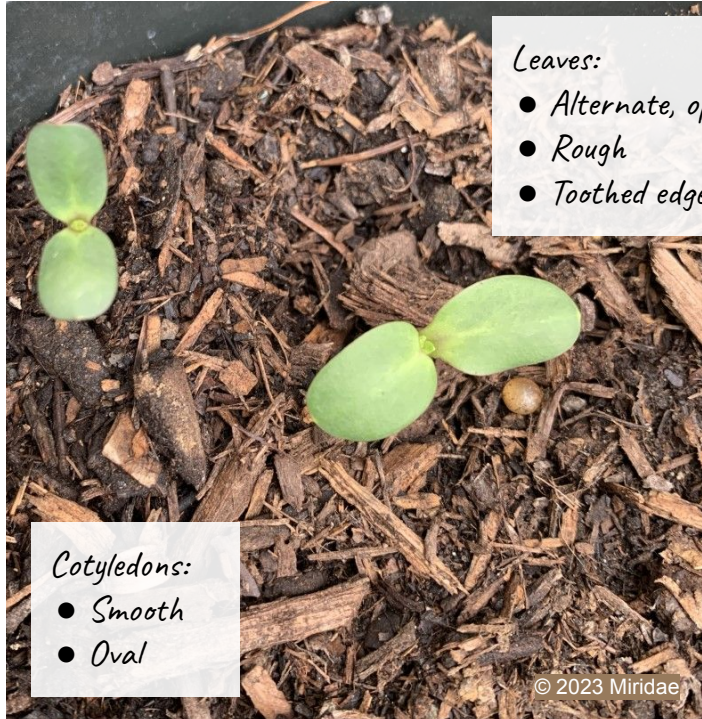
After flowering:

- Outer and inner petals (or, ray and disk florets) drop, leaving a circle of seeds





Sunflower, *Helianthus annuus*





Sunflower, *Helianthus annuus*

Flowers:

- Yellow rays
- Large brown center disc
- Many petals



© 2009 Ekabhishek
via Calscape



© 2008 Zoya Akulova via Calscape

After flowering:

- Black/brown, ovoid, flat seeds



© 2008 Zoya Akulova via Calscape



Baby blue eyes, *Nemophila menziesii*



Cotyledons:

- Oval
- Lobed

© 2010 Erutuon via Flickr



Leaves:

- Deep opposite lobes
- Larger at base

© 2010 Zoya Akulova
via Calscape



Flowers:

- Violet/blue with white center
- Black dots and blue veins on petals
- Five petals

© 2013 Neal Kramer
via Calscape



Baby blue eyes, *Nemophila menziesii*



Flowers:

- Violet/blue with white center
- Black dots and blue veins on petals
- Five petals

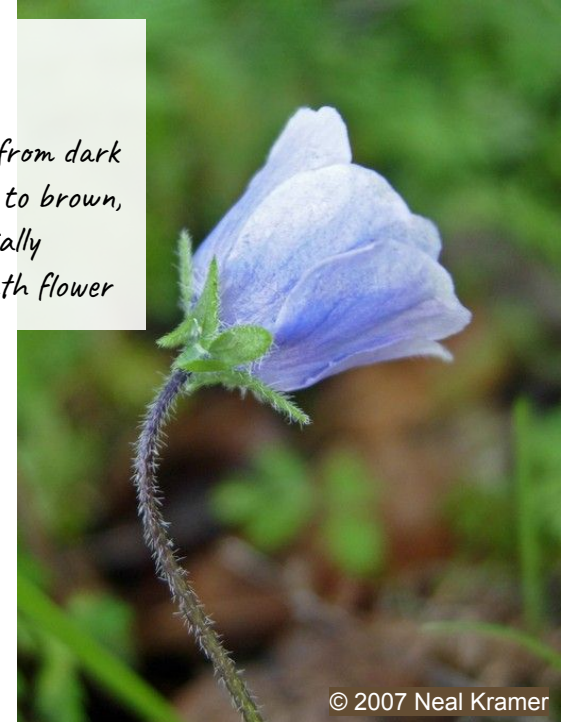
© 2013 Neal Kramer
via Calscape



Stems:

- Hairy
- Vary from dark green to brown, especially beneath flower

© 2015 Keir Morse



© 2007 Neal Kramer



Rock phacelia, *Phacelia californica*

Cotyledons:

- Round
- Hairy



Leaves:

- Basal
- Alternate
- Deeply veined
- Fuzzy





Rock phacelia, *Phacelia californica*



© 2012 Neal Kramer
via Calscape

Flowers:

- Lavender
- Dense, hairy clusters
- Five petals
- One-sided curving or coiling



Stems:

- Hairy
- Can have red, purple-ish hue

© 2014 Neal Kramer
via Calscape



© 2011 Margo Bors via Calscape



Lacy phacelia, *Phacelia tanacetifolia*

Cotyledons:

- Oval
- Narrow
- Seeds will only germinate in darkness

© Salicyna
NC Extension

Leaves:

- Alternate
- Divided into smaller leaflets
- Intricately cut into toothed lobes

© Rasbak
NC Extension

© Salicyna



Lacy phacelia, *Phacelia tanacetifolia*



Flowers:

- Blue/lavender
- Nectar-rich
- Arranged in a coil or curve



After flowering:

- Plant dries to brown
- Petals drop leaving seed capsules remain with variable numbers of seeds per capsule





Vinegar weed, *Trichostema lanceolatum*



Cotyledons:

- Round
- Smooth



True Leaves:

- Release oils that smell like vinegar
- Soft-hairy foliage
- Lanceolate arrangement





Vinegar weed, *Trichostema lanceolatum*



Stems:

- Hairy
- Short and green
- Hold flowers in long clusters in leaf axils

© CalFlora



© 2007 Neil Kramer

Flowers:

- Striking colors of purple-blue
- Bilaterally symmetrical
- Hair-like curving stamens



© 2021 Mike Russler



California Native Grasses

You **do not need to identify** the two grass species that may pop up in your seed pile! We have included descriptions here for further information, but we are not collecting data on them.



Alkali sacaton, *Sporobolus airoides*



Purple needle grass, *Stipa pulchra*





Alkali sacaton, *Sporobolus airoides*

- Upright, fountain-like form
- Yellow flowers in summer
- Lacy seed heads create a pink haze above the foliage

© E-pood

©dirt dolphins, Gardens.org

© Theodore Payne



Purple needle grass, *Stipa pulchra*

- California state grass
- Can reach root depths of 20'
- Open, nodding flower cluster with many branches bearing spikelets



© Robert Perry



©CalFlora

