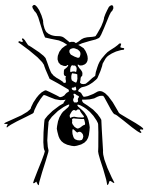

Activity #1

Weed Risk Assessment Bingo

Length:
One class period

Prerequisite Activity:
"What Makes a Plant Invasive?" and other activities from "Weed Warriors" Unit 5 in the Rain Forest Module are helpful, but not essential

Objectives:
- Learn which biological traits contribute to a plant's ability to invade new areas.
- Rate a species' "weediness," using criteria adapted from the Hawai'i-Pacific Weed Risk Assessment.
- Distinguish between non-native and invasive plants in Hawai'i.

Vocabulary:

Allergen
Corm
Disperse
Ecosystem
Evolve
Invasive
Nitrogen-fixing
Pollinate
Tuber
Vegetative fragmentation

●●● Class Period One: *Weed Risk Assessment Bingo*

Materials & Setup

Print enough bingo cards for every student to have one, plus ten or more spares, depending on how many rounds you would like to play.

For each student
- 1 Bingo card pp. 9-38
- 32 Bingo markers (pennies, beans, or other small objects will work)
- Student Page "How to Spot a Potential Plant Pest" pp. 39-40
- Scrap paper

Instructions

1) Pre-assign the Student Page "How to Spot a Potential Plant Pest" as homework or read it in class.

2) Lead a discussion about the weed risk assessment process with your students, using information from the Teacher Background page "The Hawai'i-Pacific Weed Risk Assessment."

3) Tell students that they will be playing a game of bingo based on questions drawn from the

Hawai‘i-Pacific Weed Risk Assessment. Pass out bingo cards and markers. Each card represents a different non-native species found in Hawai‘i. Some, but not all, are invasive.

4) Read the characteristics on the Teacher Background Page “Weedy Characteristics” slowly, one at a time. Students place markers on their cards as the matching characteristics are read. Characteristics have different point values. Some indicate such a high potential for invasiveness that they earn two or five points. Other characteristics indicate a low potential for invasiveness and earn a negative point score. Have students tally their scores separately on a piece of scrap paper. When a student’s card earns 9 points, it’s an invasive pest. He or she yells “pest” and the game pauses. If the card is filled out properly, he or she wins that round.

5) Have the winning student read each characteristic with a marker on it. Discuss with the class why having that characteristic might make a species likely to become invasive.

6) Remove the winning weed card from rotation, replacing it with a spare. (To illustrate the weed’s invasiveness, you can place it in a “quarantine” box.) Have students clear and swap their cards with one another between each round. Play several more rounds, reading the questions in a different order each time. In a final blackout round, the first student to completely fill his or her card wins.

7) Starting with the cards having the most markers and finishing with the cards having the least, review each of the characteristics. Discuss why having a particular suite of characteristics might make a species even more likely to become invasive. Ask how many students did not have nine markers. Plants that score just below nine fall into a gray area: they may or may not be weeds. At present they are not likely to become invasive, but they require further evaluation. Plants with low scores are not weeds. They can be safely planted in Hawai‘i. Ask students to guess the identity of their species. The cards are numbered; match the numbers on the cards to the numbered species.

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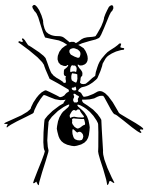


Journal Ideas

- What characteristics make a plant weedy? What characteristics don't appear to affect weediness? What could be the influence of certain combinations of characteristics? (For instance "bird-dispersed" and "many seeds.")
- Do you think that plants that score high on the Hawai'i-Pacific Weed Risk Assessment should be allowed into Hawai'i? Why or why not? What about plants that score low?
- What are the benefits of using non-weedy species in landscaping and agriculture?
- Name a species that has weedy characteristics but is also considered useful in Hawai'i. Who gains from its use? Who (or what) is negatively impacted by its continued use? Is it possible to mitigate the negative impacts? Who should be responsible for/pay for that mitigation?

Assessment Tools

- Participation in game and discussion
- Journal entries

Teacher Background

Hawai‘i-Pacific Weed Risk Assessment

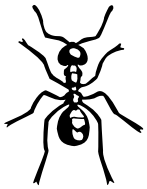
The purpose of a weed risk assessment is to identify species that are likely to become invasive pests in a given area. This allows consumers, nursery owners, and resource managers to make informed decisions about what non-native plants can be safely imported and planted.

The Hawai‘i-Pacific Weed Risk Assessment (WRA) is a series of forty-nine questions relating to the species’ biology, geographic origin, and behavior in Hawai‘i and elsewhere. Biologists consult published scientific records to answer the yes or no questions, which results in a score for each species.

A high score (7 or more*) means the plant poses a high risk of becoming an invasive pest in Hawai‘i and other Pacific Islands. A score of zero or below indicates that the plant is not likely to have major ecological or economic impacts in Hawai‘i or on other Pacific Islands, based on the screening process. Plants that score 1-6 fall in a gray area. More information is needed to determine whether they could have major ecological or economic consequences in Hawai‘i or on other Pacific Islands. The WRA is a proactive reference tool; it has no regulatory function at this time.

Learn more about the WRA:
http://www.botany.hawaii.edu/faculty/daehler/wra/

*For the purposes of this lesson’s game, the score has been adjusted. In the game, plants that score 9 and higher are invasive.



Teacher Background

Weedy Characteristics for Bingo

(The following questions were adapted from the Hawai'i-Pacific Weed Risk Assessment for the purpose of this game only. They will not provide an accurate score and should not be used outside of the classroom.)

Read to students:
These are some of the questions that biologists use to determine whether or not a plant is likely to be invasive in Hawai'i. Each bingo card represents a real plant, which may or may not be a weed. As the questions are read, add markers to the matching squares on your card. Some characteristics score more than one point, others score zero points, and some subtract a point. Keep a tally of your score on a piece of scrap paper. If your plant scores nine or more, it's a pest. Yell "pest!"

- Does it have a climbing or smothering growth habit? (Yes = 1) Vines and climbing plants can completely shroud other vegetation, including trees, blocking out sunlight and eventually weakening or killing the underlying plants.

- Does it form dense thickets? (Yes = 1) Plants that grow closely together in dense thickets deprive other vegetation of light, water, and nutrients. They can prevent other plants from growing in an area. Such thick growth also impedes the movement of humans and animals in an area.

- Is it a grass? (Yes = 1) Grasses tend to be very competitive. They are adapted to grow quickly, disperse rapidly, and form thick cover. They may also tolerate grazing or fires that can kill other plants.

- Is it a nitrogen-fixing woody plant? (Yes = 1) Nitrogen-fixing plants (mostly legumes, plants in the pea family) have bacteria in their roots that convert nitrogen from the air into a form that plants can use. Nitrogen is an essential nutrient for all plant growth, and these plants may have a competitive edge with this built-in ability to produce their own fertilizer.

- Does it form underground storage organs, such as corms or tubers? (Yes = 1) Plants store energy in these structures, allowing them to resprout or grow back even after repeated cutting, browsing by animals, fires, or droughts.

- Is it water dispersed? (Yes = 1) Plants with buoyant seeds or plant parts can spread rapidly and invade waterways, rivers, streams, and coastlines.

- Is it wind dispersed? (Yes = 1) Wind-dispersed seeds tend to be small and often have hairs, wings, or other structures that allow them to travel long distances on wind currents. These plants have the ability to invade very remote and isolated areas.

- Is it bird dispersed? (Yes = 1) Bird-dispersed seeds are found in fleshy or pulpy fruits that birds like to eat. Birds swallow the seeds, then deposit them later, after they've flown somewhere new.

Bird-dispersed plants have the ability to spread rapidly far from the original seed source.

- Is it likely to be dispersed by humans? (Yes = 1) Plants that people desire (as food, fuel, or ornamentals) tend to be planted wherever people live, work, or grow crops. This gives plants an added opportunity to invade new areas.

- Does it require specialist pollinators? (Yes = -1) Plants that have specific pollinators, such as hummingbirds, bats, large moths, etc., may not be able to produce seeds in a new area lacking their pollinator. Therefore, requiring specialist pollinators is a handicap, not a weedy advantage.

- Is the species suited to a tropical climate? (Yes = 1) Species suited to a tropical climate will find themselves at home in the Hawaiian Islands.

- What is the quality of climate match? (Medium =1, High =2) Tropical climates can vary. Some are hotter, more humid than Hawai‘i. Plants coming from a climate that closely resembles those found in these Islands will have a good chance of thriving here.

- Does it have broad climate suitability? (Yes = 1) Some plants can invade a variety of climates. They would find many niches on Maui, where diverse ecosystems range from sunny coastline to snow-capped summit.

- Is it an agricultural or forestry weed? (Yes = 2) Some plants compete with valuable farm crops, or forestry plantations, reducing yields and increasing management costs. Others may be unpalatable to cattle or other grazing animals and reduce the quality of pasture. If a plant has been reported as an agricultural or forestry weed elsewhere, it is likely to be one in Hawai‘i.

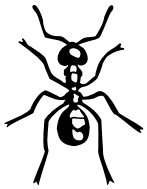
- Is it an environmental weed? (Yes = 2) Environmental weeds invade natural areas, compete with native species and threaten biodiversity. They can also degrade the functioning of watersheds, increase erosion, and modify soil health. If a plant has been reported as environmental weed elsewhere, it is likely to be one in Hawai‘i.

- Is it a member of the melastome family? (Yes = 1) Many plants in the melastome family have proven themselves to be fast-spreading pests throughout the Pacific. If it’s been recognized as a problem species in similar island environments, it’s likely to be one here.

- Is it aquatic? (Yes = 5) Aquatic plants introduced into new areas almost always become highly invasive. When freed from natural competitors or predators, they often experience “explosive” growth rates and quickly dominate their new habitat.

- Does it produce spines, thorns or burrs? (Yes = 1) Plants armed with these natural defenses can harm or injure humans and animals, and may outcompete plants lacking this protection. Spines, thorns and burrs also make removal or control of the species more difficult, and hazardous.

- Is it an allergen, or toxic to humans? (Yes = 1) Some plants have chemicals or pollen that can cause rashes, severe allergic reactions, sickness, or even death to people that come into contact with or consume them.



- Is it toxic to animals? (Yes = 1) Poisonous plants can harm the health of pets and livestock that accidentally eat or come into contact with them. These plants can thrive even in areas with pressure from grazing animals.

- Is it a fire hazard? (Yes = 1) Certain plants (especially some grasses) increase the risk of fire to both natural and residential areas. They may produce a lot of biomass that easily burns when it dries out, or they may contain highly flammable chemicals in their leaves or sap.

- Is it shade tolerant? (Yes = 1) Plants that tolerate low light levels are often able to invade the understory of intact, native forests and may eventually outcompete native vegetation.

- Does it reproduce by vegetative fragmentation? (Yes = 1) Some plants are able to re-sprout from pieces of stems, roots, and even leaves that either break off or are cut off from the parent plant. This enables them to spread without producing seeds, and makes control or removal of these plants difficult.

- Matures within 1 year? (1 year = 1, more than 1 = 0) Plants that mature in one year or less are able to produce seeds rapidly. They tend to invade new areas and persist in areas much longer than slower growing plants.

- Is it capable of prolific seed production? (Yes =1) When plants produce large numbers of seeds, they increase their ability to take over an area as well as to spread away from the site and invade new areas.

- Does it have a persistent seed bank? (Yes =1) Seeds that remain viable or fertile in the soil for long periods of time are able to germinate years, or decades, after the parent plant is gone. This ability can make removal or eradication of certain plants difficult, if not impossible.

Teacher Background

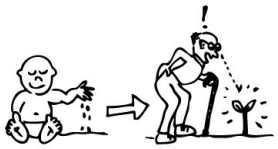
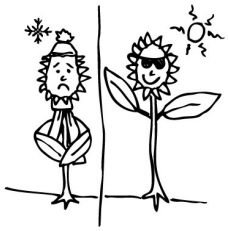
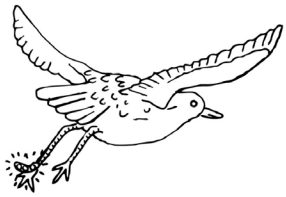
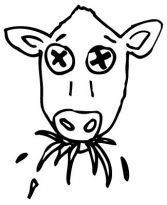
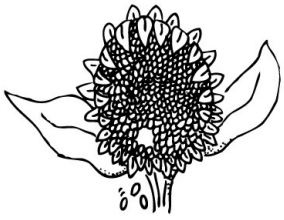
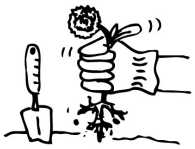
Bingo Card Plant Species (30 unique cards)

Card #	Common Name	Scientific Name	Number of Points
1.	ʻAwa	(*Piper methysticum*)	[7]
2.	Plumeria	(*Plumeria rubra*)	[5]
3.	Banana	(*Musa* sp)	[6]
4.	Hawaiian bamboo	(*Schizostachyum glaucifolium*)	[8]
5.	Miconia	(*Miconia Calvescens*)	[14]
6.	Iron wood	(*Casuarina equisetifolia*)	[15]
7.	Ivy gourd	(*Coccinia grandis*)	[14]
8.	Pampas grass	(*Cortaderia jubata*)	[19*]
9.	Banana poka	(*Passiflora tarminiana*)	[14]
10.	Fountain grass	(*Pennisetum setaceum*)	[16]
11.	Long thorn kiawe	(*Prosopis juliflora*)	[16]
12.	Strawberry guava	(*Psidium cattleianum*)	[13]
13.	Castor bean	(*Ricinus communis*)	[15]
14.	Yellow Himalayan raspberry	(*Rubus ellipticus*)	[15]
15.	Giant salvinia	(*Salvinia molesta*)	[23*]
16.	Christmas berry	(*Schinus terebinthifolius*)	[16]
17.	Fireweed	(*Senecio madagascariensis*)	[15]
18.	Gorse	(*Ulex europaeus*)	[16]
19.	Cane tibouchina	(*Tibouchina herbacea*)	[16]
20.	Mountain apple	(*Szygium malaccense*)	[8]
21.	Shampoo ginger	(*Zingiber zerumbet*)	[6]
22.	Breadfruit	(*Artocarpus altilis*)	[6]
23.	Coconut palm	(*Cocos nucifera*)	[5]
24.	Spider lily	(*Crinum asiaticum*)	[7]
25.	Royal Poinciana	(*Delonix regia*)	[8]
26.	Wattle	(*Acacia mearnsii*)	[15]
27.	Arundo	(*Arundo donax*)	[14]
28.	Cat's claw	(*Caesalpinia decapetala*)	[16]
29.	Kahili ginger	(*Hedychium gardnerianum*)	[12]
30.	Lantana	(*Lantana camara*)	[15]

*Blackout

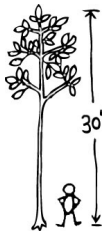
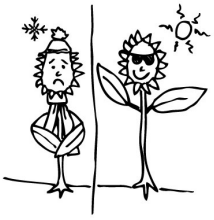
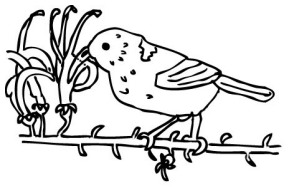
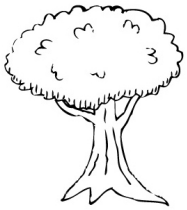
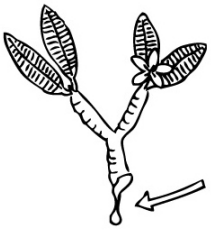
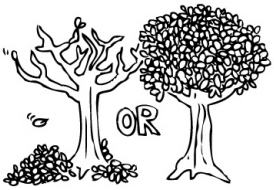
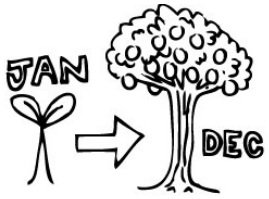
Weed Assessment Bingo

#1

Persistent seed bank 	Environmental weed 	Evergreen 	Grows to 7 feet tall 
Shrub 	Likely to be dispersed by humans 	Fire hazard 	Native to tropical America & Africa 
Quality of climate match: high 	Bird dispersed 	Toxic to animals 	Prolific seed production 
Species suited to tropical climate 	Agricultural/ Forestry weed 	Forms dense thickets 	Produces spines, thorns or burrs 

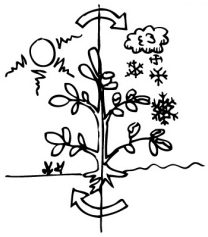
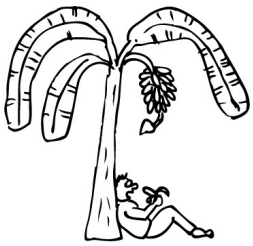
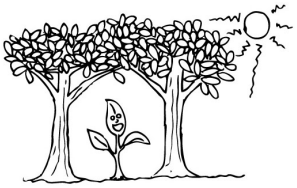
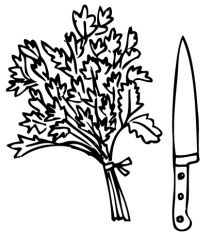
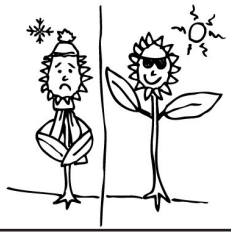
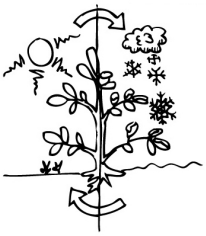
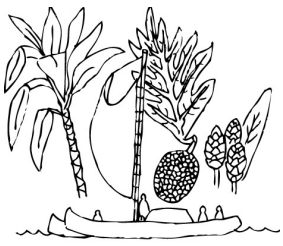
Weed Assessment Bingo

#2

Grows up to 30 feet tall 	Quality of climate match: high 	Requires specialist pollinators 	Wind dispersed 
Species suited to tropical climate 	Tree 	Allergen/toxic to humans 	Produces milky sap 
Requires full sun 	Native to tropical & subtropical Americas 	Likely to be dispersed by humans 	Deciduous & non-deciduous varieties 
Wind tolerant 	Used in lei-making 	Easily propagated 	Matures within 5 years 

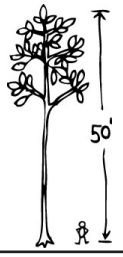
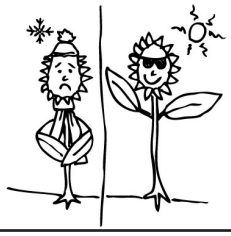
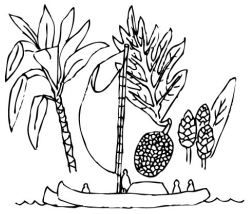
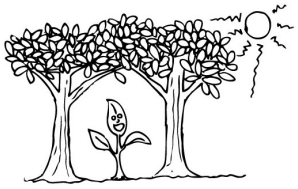
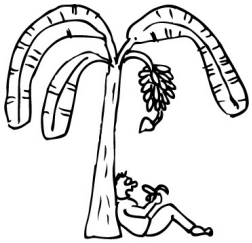
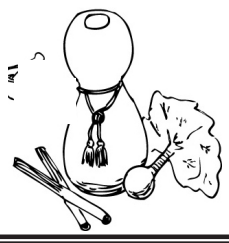
Weed Assessment Bingo

#3

Species suited for tropical climate 	Grows in clumps 	Used in medicine 	Easily propagated 
Perennial 	Edible 	Shade tolerant 	Reproduction by vegetative fragmentation 
Native to Southeast Asia 	Likely to be dispersed by humans 	Herb 	Quality of climate match: high 
Fiberous 	Perennial 	Hawaiian canoe plant 	Large leaves 

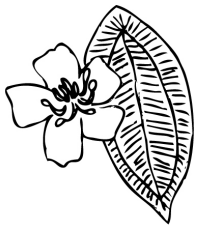
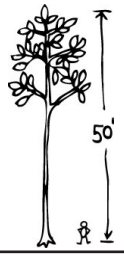
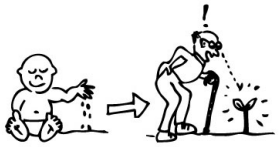
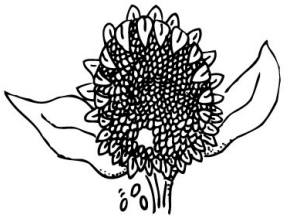
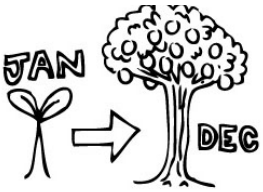
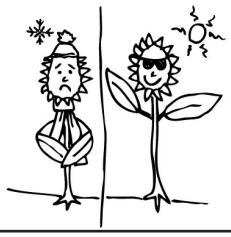
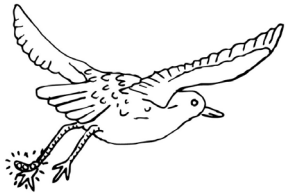
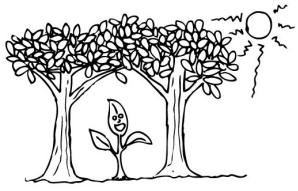
Weed Assessment Bingo

#4

Likely to be dispersed by humans 	Grows up to 50 feet tall 	Broad climate suitability 	Grass 
Evergreen 	Forms dense thickets 	Grows in clumps 	Quality of climate match: high 
Fiberous 	Native to Southeast Asia 	Species suited to tropical climate 	Hawaiian canoe plant 
Shade tolerant 	Edible 	Jointed stems 	Used to make musical instruments 

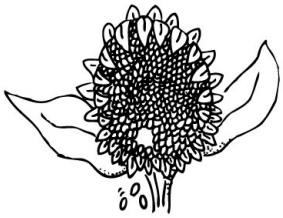
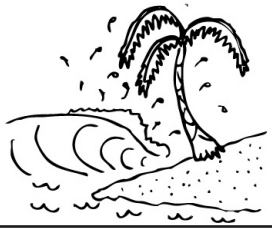
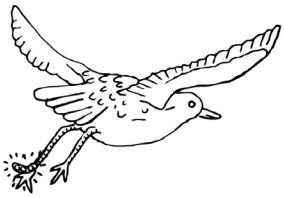
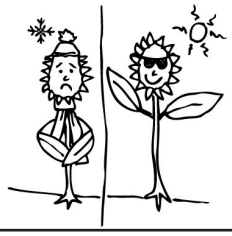
Weed Assessment Bingo

#5

Member of the Melastome Family 	Grows up to 50 feet tall 	Forms dense thickets 	Species suited to tropical climates 
Persistent seed bank 	Very large, umbrella-like leaves 	Native to Central & South America 	Water dispersed 
Prolific seed production 	Matures within four years 	Quality of climate match: high 	Broad climate suitability 
Likely to be dispersed by humans 	Bird dispersed 	Environmental weed 	Shade tolerant 

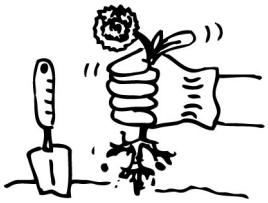
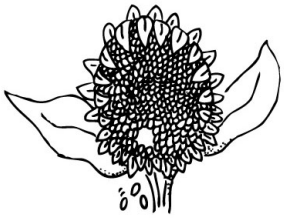
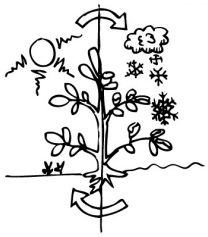
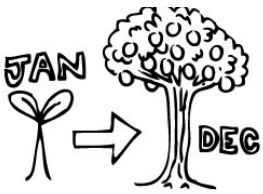
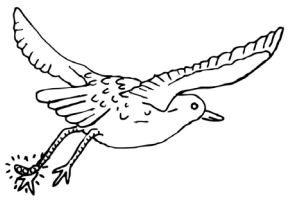
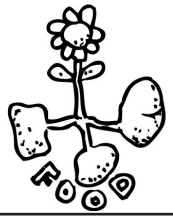
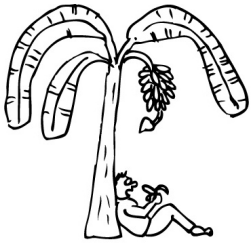
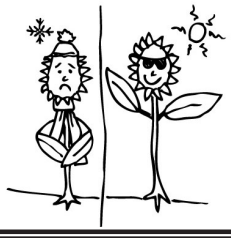
Weed Assessment Bingo

#6

Native to Australia & Southeast Asia 	Allergen/Toxic to humans 	Broad climate suitability 	Prolific seed production 
Salt tolerant 	Likely to be dispersed by humans 	Reproduction by vegetative fragmentation 	Fire hazard 
Nitrogen-fixing woody plant 	Bird dispersed 	Environmental weed 	Quality of climate match: high 
Water dispersed 	Grows to 150 feet tall 	Forms dense thickets 	Species suited to tropical climate 

Weed Assessment Bingo

#7

Climbing or smothering growth habit 	Native to Africa, India & Asia 	Agricultural/ Forestry weed 	Prolific seed production 
Perennial 	Vine 	Likely to be dispersed by humans 	Matures within one year 
Species suited to tropical climate 	Bird dispersed 	Environmental weed 	Forms underground storage organs such as corms or tubers 
Edible 	Reproduction by vegetative fragmentation 	Quality of climate match: high 	Fibrous 

Weed Assessment Bingo

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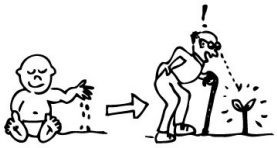
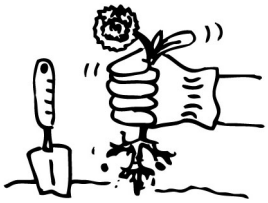
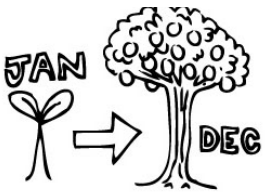
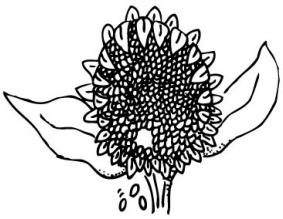
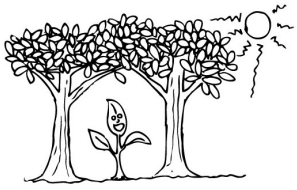
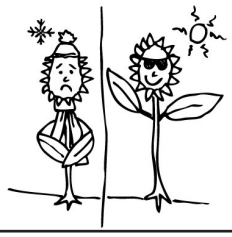
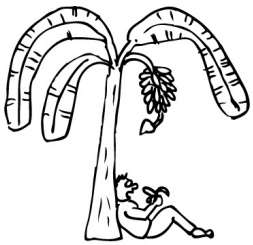
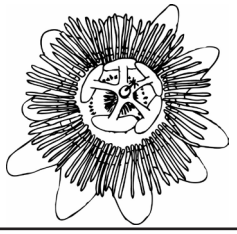
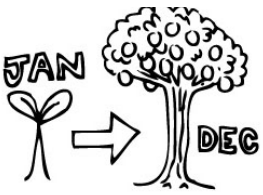
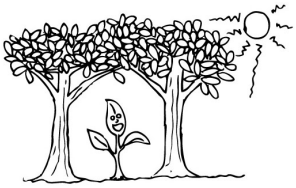
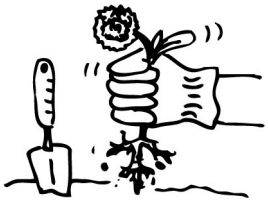
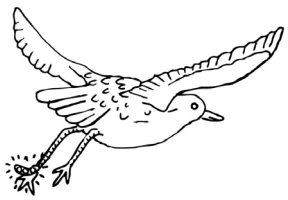
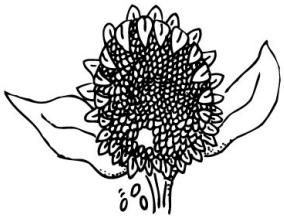
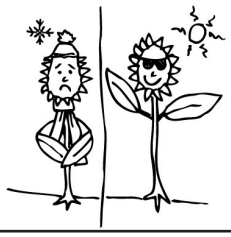
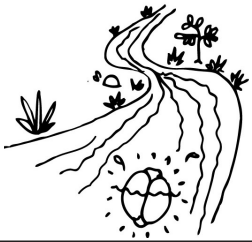
Fire hazard 	Persistent seed bank 	Broad climate suitability 	Agricultural/ Forestry weed 
Likely to be dispersed by humans 	Matures within one year 	Prolific seed production 	Grass 
Shade tolerant 	Water dispersed 	Environmental weed 	Quality of climate match: high 
Wind dispersed 	Species suited to tropical climate 	Forms dense thickets 	Produces spines, thorns or burrs 

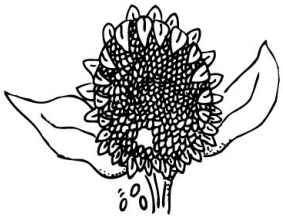
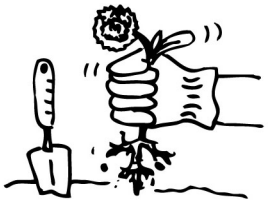
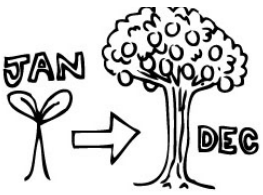
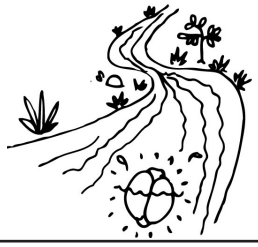
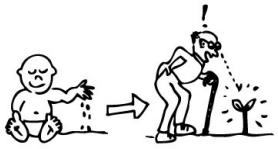
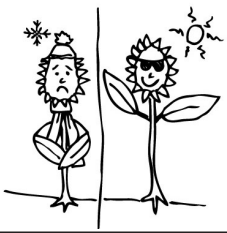
Weed Assessment Bingo

#9

Climbing or smothering growth habit 	Environmental weed 	Edible 	Member of Passiflora family 
Likely to be dispersed by humans 	Matures within one year 	Broad climate suitability 	Shade tolerant 
Agricultural/ Forestry weed 	Bird dispersed 	Prolific seed production 	Quality of climate match: medium 
Water dispersed 	Vine 	Species suited to tropical climate 	Native to South America 

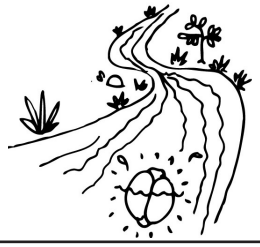
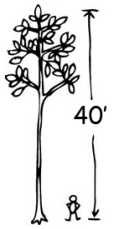
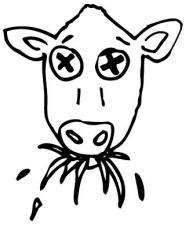
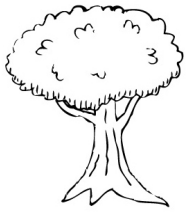
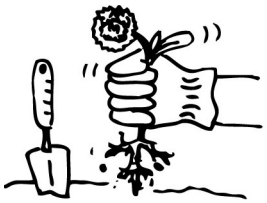
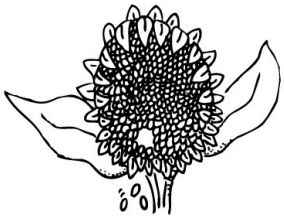
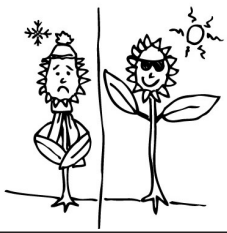
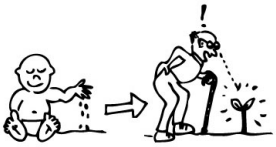
Weed Assessment Bingo

#10

Prolific seed production 	Native to North Africa 	Broad climate suitability 	Agricultural/ Forestry weed 
Likely to be dispersed by humans 	Matures within one year 	Fire hazard 	Grass 
Species suited to tropical climate 	Water dispersed 	Grows to 3 feet tall 	Grows in clumps 
Wind dispersed 	Pesistent seed bank 	Quality of climate match: high 	Environmental weed 

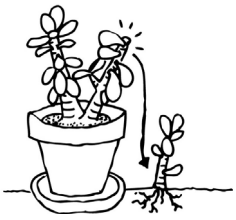
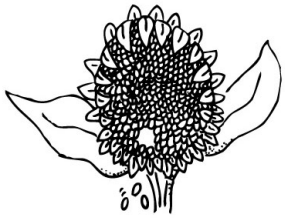
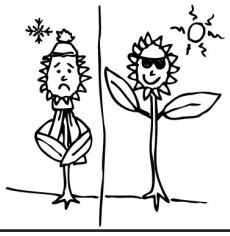
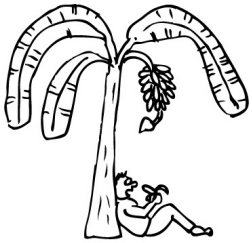
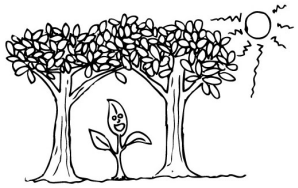
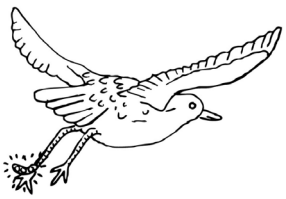
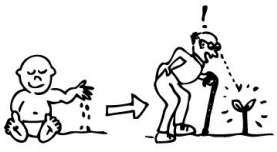
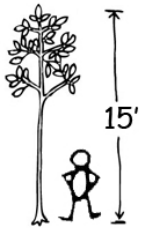
Weed Assessment Bingo

#11

Environmental weed 	Native to Africa 	Water dispersed 	Allergen/Toxic to humans 
Species suited to tropical climate 	Nitrogen-fixing woody plant 	Grows to 40 feet tall 	Toxic to animals 
Likely to be dispersed by humans 	Tree 	Agricultural/ Forestry weed 	Prolific seed production 
Quality of climate match: high 	Persistent seed bank 	Forms dense thickets 	Produces spines, thorns or burrs 

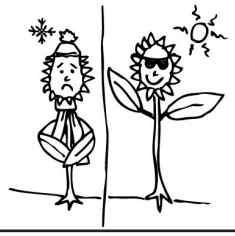
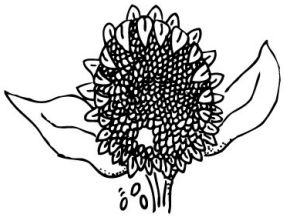
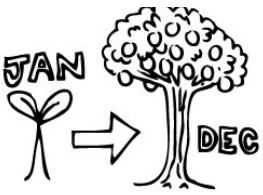
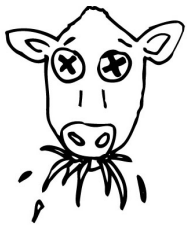
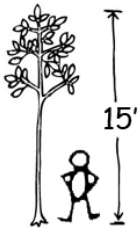
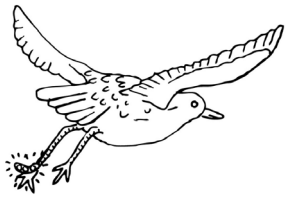
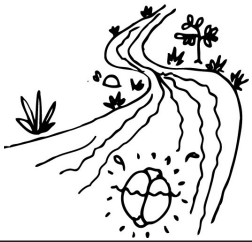
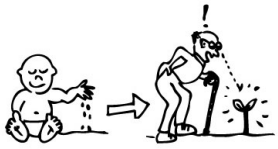
Weed Assessment Bingo

#12

Reproduces by vegetative fragmentation 	Prolific seed production 	Quality of climate match: high 	Edible 
Broad climate suitability 	Likely to be dispersed by humans 	Species suited to tropical climate 	Shade tolerant 
Tree 	Bird dispersed 	Environmental weed 	Native to Brazil 
Used to make wooden crafts 	Persistent seed bank 	Forms dense thickets 	Grows to 15 feet tall 

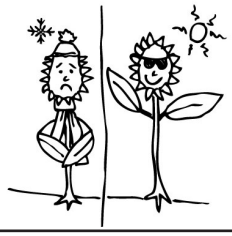
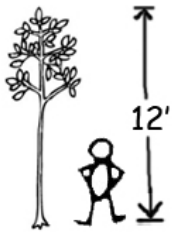
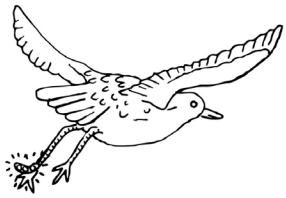
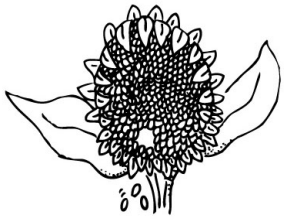
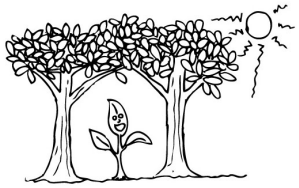
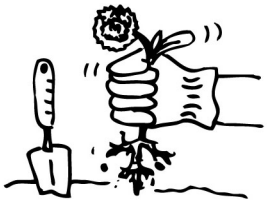
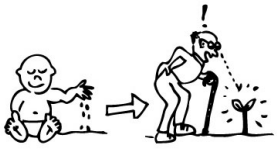
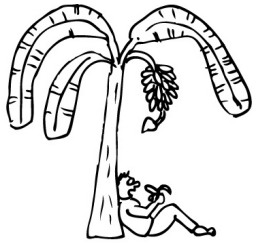
Weed Assessment Bingo

#13

Species suited to tropical climate 	Quality of climate match: high 	Broad climate suitability 	Prolific seed production 
Likely to be dispersed by humans 	Matures within one year 	Allergen/Toxic to humans 	Toxic to animals 
Grows to 15 feet tall 	Bird dispersed 	Environmental weed 	Shrub 
Water dispersed 	Persistent seed bank 	Forms dense thickets 	Native to Africa 

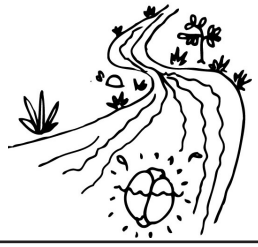
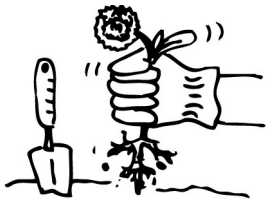
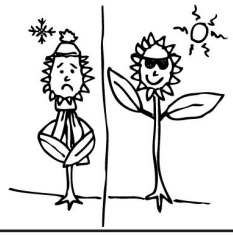
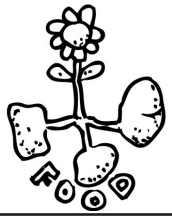
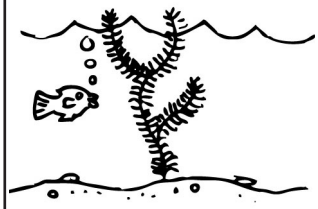
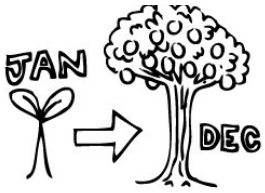
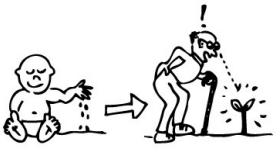
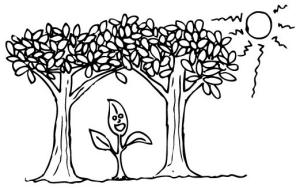
Weed Assessment Bingo

#14

Forms dense thickets 	Quality of climate match: medium 	Broad climate suitability 	Grows to 12 feet tall 
Reproduces by vegetative fragmentation 	Likely to be dispersed by humans 	Nitrogen-fixing woody plant 	Produces spines, thorns or burrs 
Bird dispersed 	Prolific seed production 	Environmental weed 	Shade tolerant 
Agricultral/Forestry weed 	Persistent seed bank 	Native to Southeast Asia 	Edible 

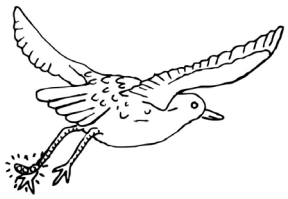
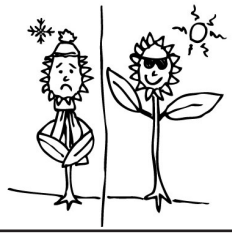
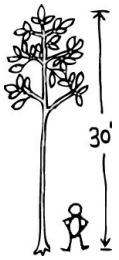
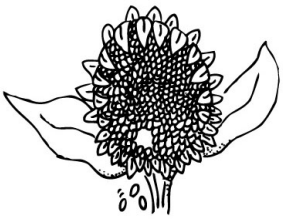
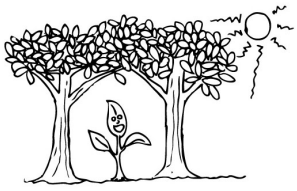
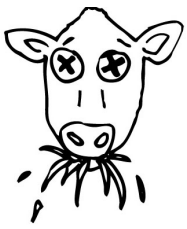
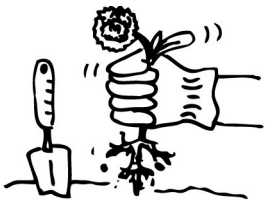
Weed Assessment Bingo

#15

Environmental weed 	Water dispersed 	Agricultural/ Forestry weed 	Quality of climate match: high 
Reproduces by vegetative fragmentation 	Forms underground storage organs such as corms or tubers 	Broad climate suitability 	Aquatic 
Forms dense thickets 	Matures within one year 	Species suited to tropical climate 	Climbing or smothering growth habit 
Wind dispersed 	Persistent seed bank 	Shade tolerant 	Likely to be dispersed by humans 

Weed Assessment Bingo

#16

Bird dispersed 	Quality of climate match: high 	Native to Brazil 	Grows to 30 feet tall 
Reproduces by vegetative fragmentation 	Likely to be dispersed by humans 	Prolific seed production 	Allergen/toxic to humans 
Shade tolerant 	Species suited to tropical climate 	Environmental weed 	Forms dense thickets 
Wind dispersed 	Tree 	Toxic to animals 	Agricultural/ Forestry weed 

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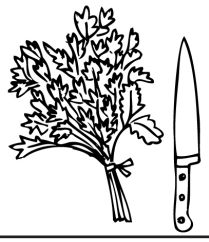
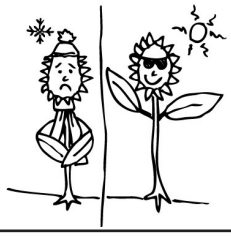
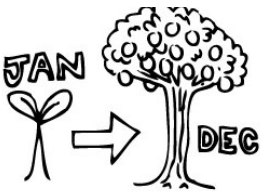
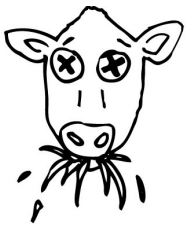
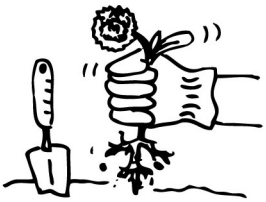
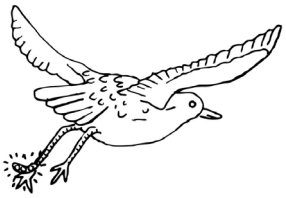
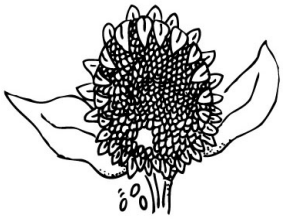
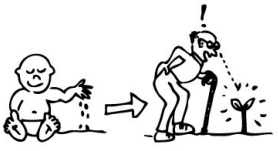
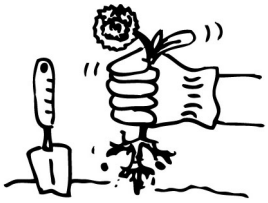
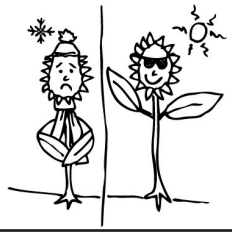
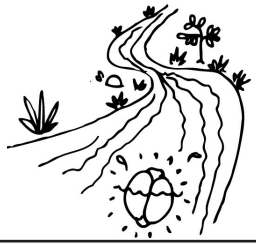
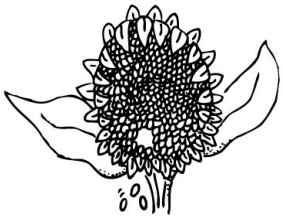
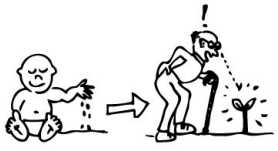
Reproduction by vegetative fragmentation 	Grows to two feet tall 	Herb 	Quality of climate match: high 
Broad climate suitability 	Matures within one year 	Species suited to tropical climate 	Toxic to animals 
Agricultural/ Forestry weed 	Bird dispersed 	Prolific seed production 	Wind dispersed 
Member of the Aster family 	Persistent seed bank 	Native to South Africa 	Environmental weed 

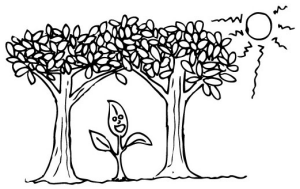
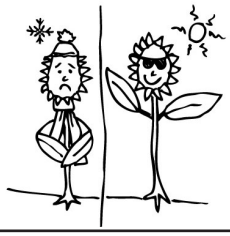
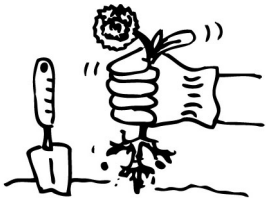
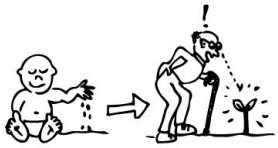
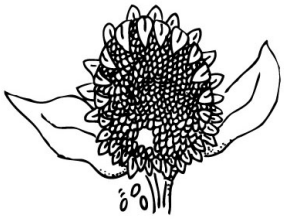
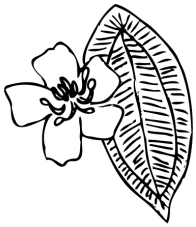
Weed Assessment Bingo

#18

Allergen/Toxic to humans 	Reproduction by vegetative fragmentation 	Broad climate suitability 	Forms dense thickets 
Agricultural/ Forestry week 	Evergreen 	Quality of climate match: high 	Fire hazard 
Likely to be dispersed by humans 	Water dispersed 	Species suited to tropical climate 	Prolific seed production 
Produces spines, thorns or burrs 	Shrub 	Nitrogen-fixing woody plant 	Persistent seed bank 

Weed Assessment Bingo

#19

Water dispersed 	Shade tolerant 	Quality of climate match: high 	Species suited to tropical climate 
Reproduces by vegetative fragmentation 	Likely to be dispersed by humans 	Agricultural/ Forestry weed 	Persistent seed bank 
Wind dispersed 	Native to Brazil 	Prolific seed production 	Forms dense thickets 
Member of the Melastome family 	Shrub 	Grows up to six feet tall 	Environmental weed 

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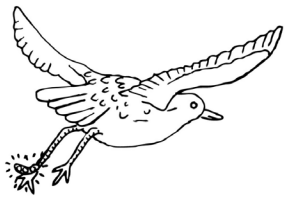
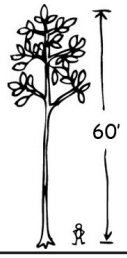
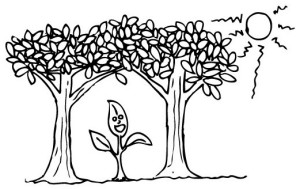
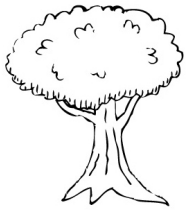
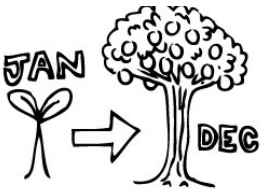
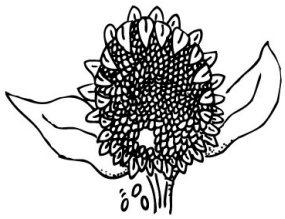
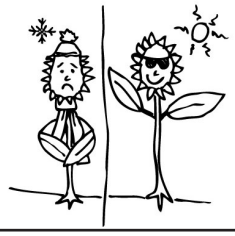
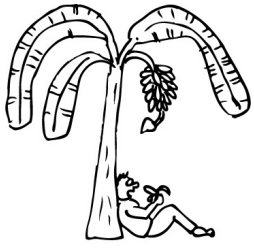
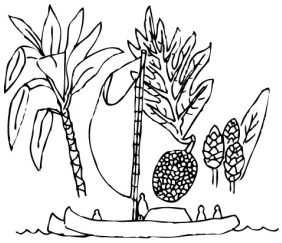
Bird dispersed 	Grows to 60 feet tall 	Shade tolerant 	Tree 
Reproduces by vegetative fragmentation 	Matures within seven years 	Prolific seed production 	Likely to be dispersed by humans 
Quality of climate match: high 	Belongs to the Myrtle family 	Species suited to tropical climate 	Edible 
Hawaiian canoe plant 	Used in dye 	Native to Malaysia 	Evergreen 

Weed Assessment Bingo

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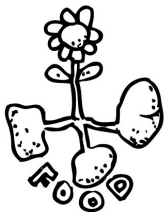
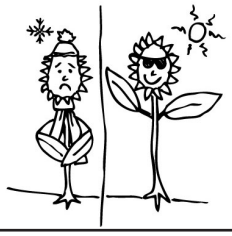
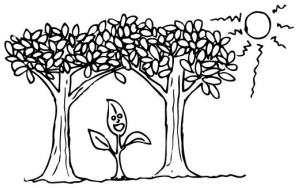
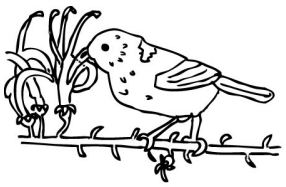
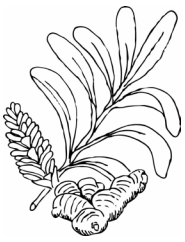
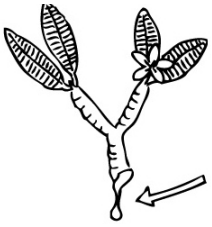
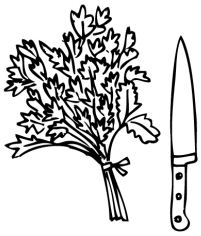
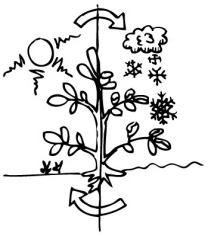
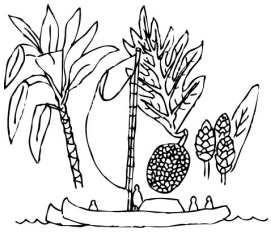
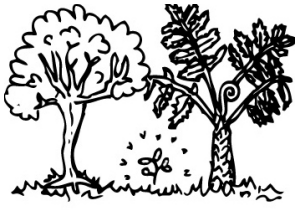
Forms underground storage organs such as corms or tubers 	Quality of climate match: high 	Shade tolerant 	Requires special pollinators 
Reproduces by vegetative fragmentation 	Member of the Ginger family 	Likely to be dispersed by humans 	Grows up to 7 feet tall 
Species suited to tropical climate 	Produces aromatic sap 	Herb 	Perennial 
Native to India 	Easily propagated 	Hawaiian canoe plant 	Understory plant 

Weed Assessment Bingo

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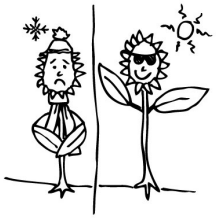
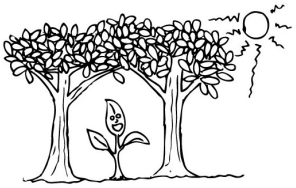
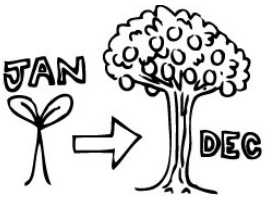
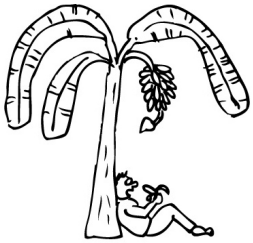
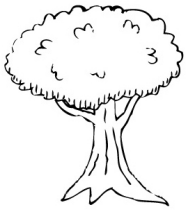
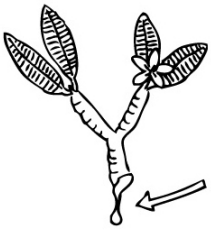
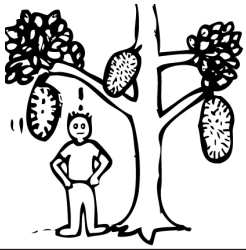
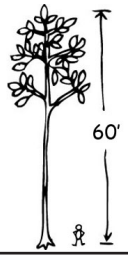
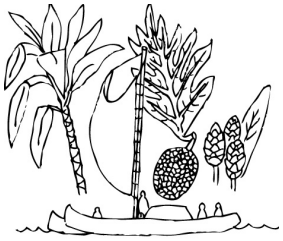
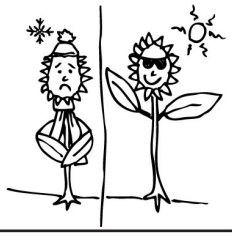
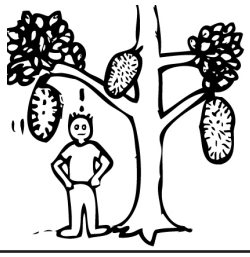
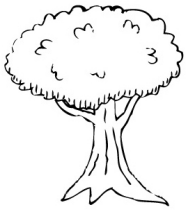
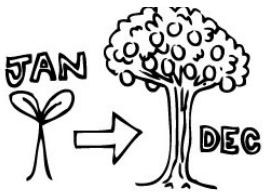
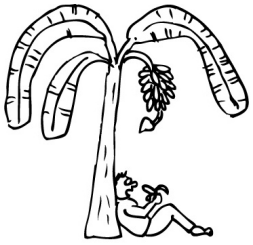
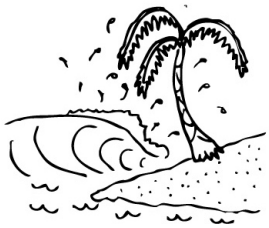
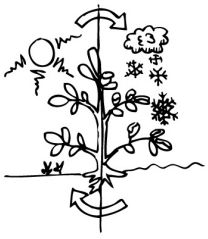
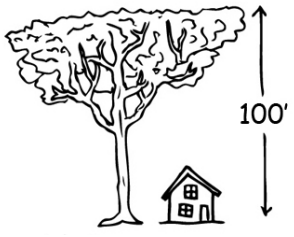
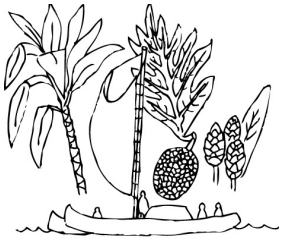
Species suited to tropical climate 	Quality of climate match: high 	Shade tolerant 	Matures within four years 
Edible 	Likely to be dispersed by humans 	Tree 	Produces milky sap 
Large seeds/fruits 	Grows to 60 feet tall 	Belongs to Mulberry family 	Hawaiian canoe plant 
Reproduction by vegetative fragmentation 	Easily propogated 	Native to Polynesia 	Used in medicine 

Weed Assessment Bingo

#23

Species suited to tropical climate 	Quality of climate match: high 	Water dispersed 	Likely to be dispersed by humans 
Large seeds/fruits 	Tree 	Matures within six years 	Edible 
Salt tolerant 	Perennial 	Grows to 100 feet tall 	Native to South East Asia and Melanesia 
Large leaves 	Hawaiian canoe plant 	Used for thatching, cordage 	Fibrous 

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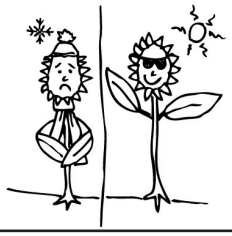
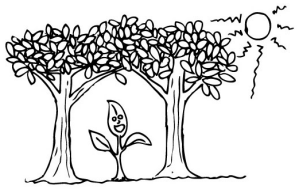
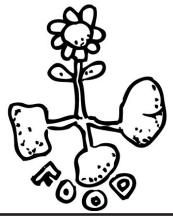
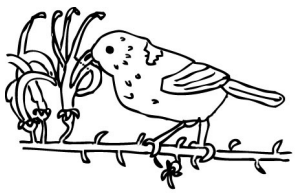
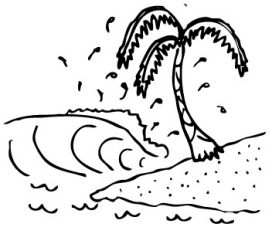
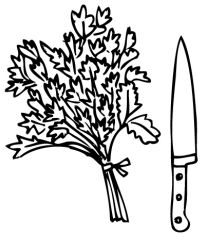
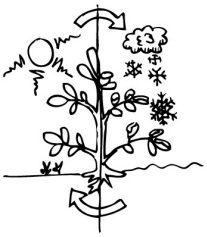
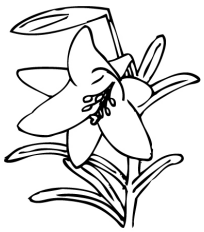
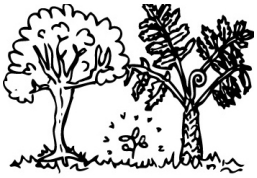
#24

Species suited to tropical climate 	Quality of climate match: high 	Forms dense thickets 	Shade tolerant 
Forms underground storage organs such as corms or tubers 	Requires special pollinators 	Likely to be dispersed by humans 	Allergen/toxic to humans 
Salt tolerant 	Herb 	Grows up to seven feet tall 	Perennial 
Belongs to the Lily family 	Native to Souteast Asia 	Grows in clumps 	Understory plant 

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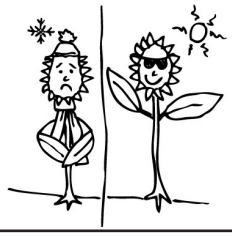
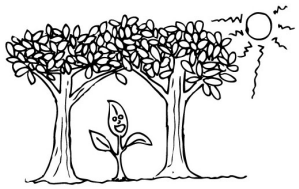
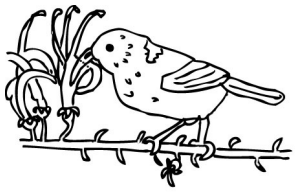
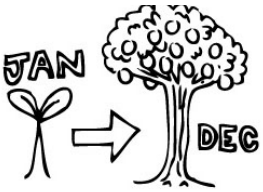
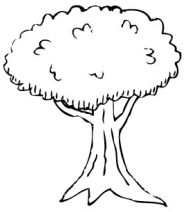
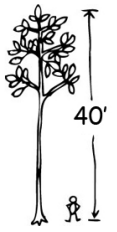
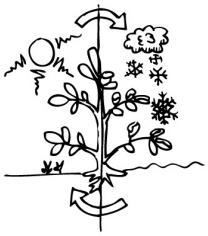
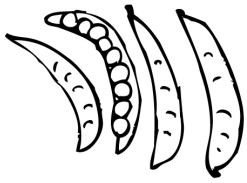
Species suited to tropical climate 	Quality of climate match: high 	Shade tolerant 	Wind dispersed 
Broad climate suitability 	Nitrogen-fixing woody plant 	Requires special pollinators 	Matures within four years 
Likely to be dispersed by humans 	Persistent seed bank 	Tree 	Grows to 40 feet tall 
Perennial 	Native to Madagascar 	Belongs to the Legume family 	Branches can span 40 feet or more 

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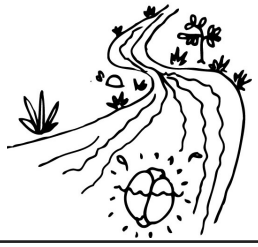
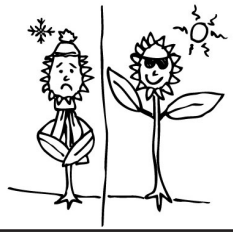
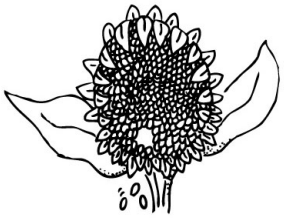
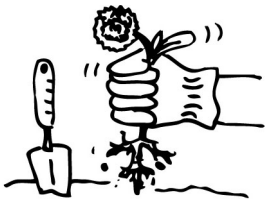
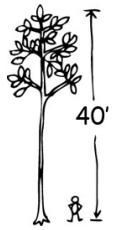
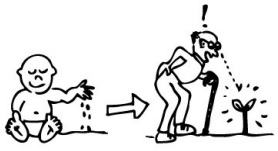
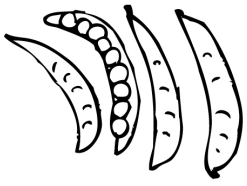
Species suited to tropical climate 	Water dispersed 	Quality of climate match: high 	Prolific seed production 
Broad climate suitability 	Fire hazard 	Nitrogen-fixing woody plant 	Likely to be dispersed by humans 
Tree 	Native to Australia 	Environmental weed 	Agricultural / Forestry weed 
Grows up to 40 feet tall 	Persistent seed bank 	Forms dense thickets 	Belongs to the Legume family 

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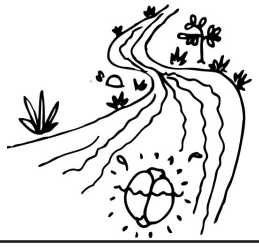
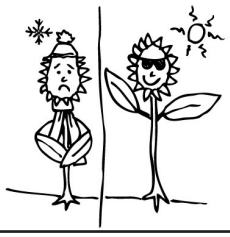
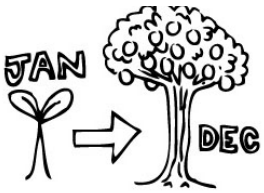
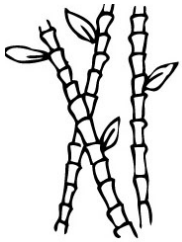
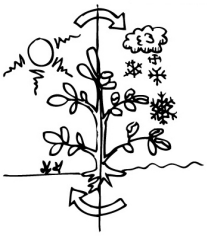
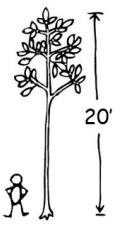
#27

Species suited to tropical climate 	Water dispersed 	Quality of climate match: high 	Broad climate suitability 
Reproduction by vegetative fragmentation 	Matures within one year 	Jointed stems 	Fire hazard 
Grass 	Perennial 	Environmental weed 	Likely to be dispersed by humans 
Wind dispersed 	Native to Southeast Asia 	Forms dense thickets 	Grows to 20 feet tall 

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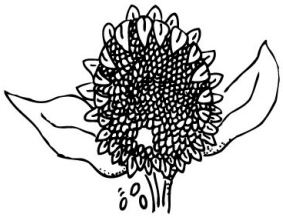
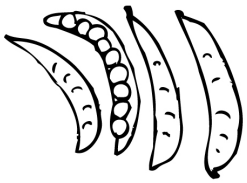
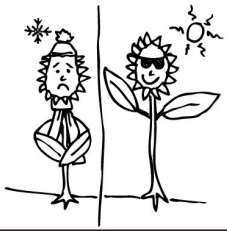
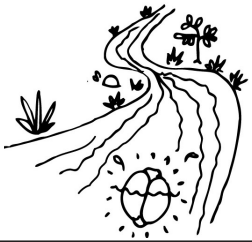
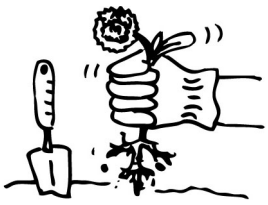
Likely to be dispersed by humans 	Environmental weed 	Climbing or smothering growth habit 	Prolific seed production 
Broad climate suitability 	Belongs to the Legume family 	Fire hazard 	Nitrogen-fixing woody plant 
Quality of climate match: high 	Water dispersed 	Native to Southeast Asia 	Vine 
Agricultural / Forestry weed 	Species suited to tropical climate 	Forms dense thickets 	Produces spines, thorns or burrs 

Weed Assessment Bingo

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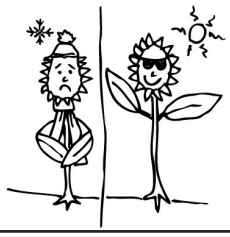
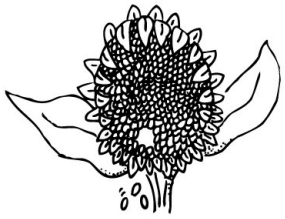
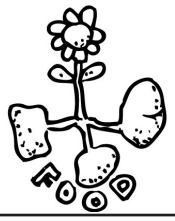
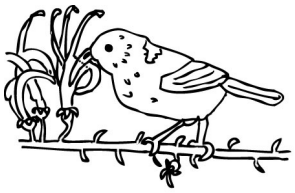
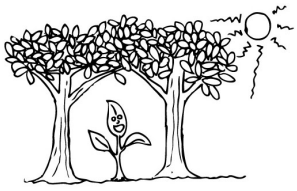
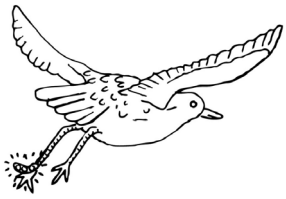
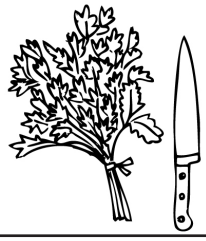
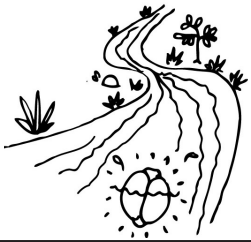
Species suited to tropical climate 	Quality of climate match: high 	Broad climate suitability 	Prolific seed production 
Reproduction by vegetative fragmentation 	Forms underground storage organs such as corms or tubers 	Requires specialist pollinators 	Likely to be dispersed by humans 
Shade tolerant 	Bird dispersed 	Environmental weed 	Herb 
Water dispersed 	Native to India 	Forms dense thickets 	Grows to 6 feet tall 

Weed Assessment Bingo

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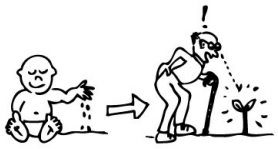
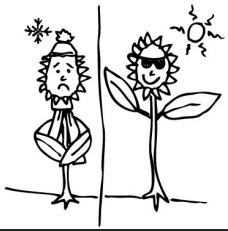
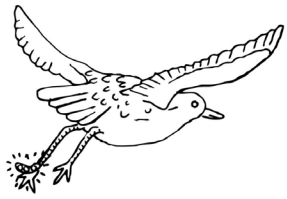
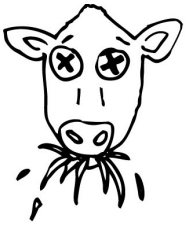
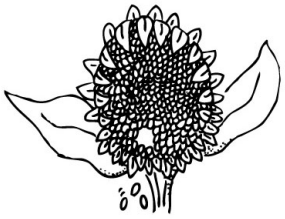
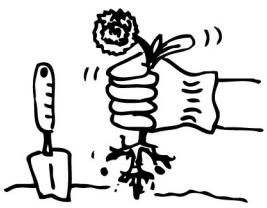
Persistent seed bank 	Environmental weed 	Evergreen 	Grows to 6 feet tall 
Shrub 	Likely to be dispersed by humans 	Fire hazard 	Native to tropical Americas and Africa 
Quality of climate match: high 	Bird dispersed 	Toxic to animals 	Prolific seed production 
Species suited to tropical climate 	Agricultural / Forestry weed 	Forms dense thickets 	Produces spines, thorns or burrs