

Activity: Plant Care Goal: Social Populations: All

TH Activity Plan – Plant Maze & Phototropism

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Photo by Instagram



ACTIVITY DESCRIPTION: Participants will build a plant maze & observe the phototropism plant growth over several weeks.

THERAPEUTIC GOALS:

Cognitive/Intellectual: Acquire horticultural knowledge through observation & discussion; practice reasoning skills

Physical: Strengthen hand-eye coordination; use fine motor skills

Psychological/Emotional: Investigate factors that contribute to growth of plants & humans; improve social emotional interactions

Sensory: Observe how light impacts plant growth

Social: Share materials with others; offer assistance to others; build a science project with a partner working cooperatively

STEP-BY-STEP PROCESS:

1. **Pre-Session Preparation:** Accumulate materials which may require month long preparation for gathering sufficient number of boxes. Make sample ahead so that plant bending (phototropism) is obvious.
2. Facilitator begins session by showing an example of the plant maze with a plant growing inside.
3. Discuss plant growth & phototropism, hypothesizing the outcome of plant growth, & relating these to plant inputs of light, water, & fertilizer.
4. Distribute materials to teams of two. Teams begin construction of maze, placing box on end, cutting hole in one end of box, taping 2 pieces of cardboard/posterboard inside (they are less than the full width of box), staggering them so that open space is not directly above the other (see photo left).
5. Plant or have on hand a seedling or bean sprout in a small container, one per team, well-watered, and then placed in plant maze at opposite end of light source. Close box so that light is only available from the top hole. Keep covered.
6. Remove covering to observe plant growth over a period of time &/or to water if needed, keeping plant moist.
7. In subsequent session, discuss plant growth, need for light, and tropisms. Relate these to human need for light and other inputs like care & nurturing, nutrition, & warmth.

Materials

Small cardboard boxes
(Amazon or shoe boxes)

Extra cardboard or
posterboard

Scissors, tape, knife or
screwdriver, water can

Seedling or materials to plant
bean sprout (beans, soil or
water, container)

Gloves, wipes

APPLICATIONS FOR POPULATIONS: Building a plant maze offers many applications for therapeutic, educational, recreational and social engagement. Often used in classrooms with [correlated academic standards](#) by grade level and subject areas, this activity as noted above lends itself to incorporating a range of therapeutic goals in each health domain. One key area is that of social interactions, particularly when delivered as a team/2 person project.

Social goals can include social emotional learning - cooperation, sharing, awareness of others and their physical proximity as well as their feelings/emotions, practiced during the TH activity, with guidance and cueing from the facilitator.

[Social emotional learning](#) (SEL), important for functioning, is defined as “the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions” (Massachusetts Department of Elementary and Secondary Education, 2024). The five core competencies of SEL can be practiced in Plant Maze & Phototropism activity. These include: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making.

The physical requirements for this activity can be adapted depending on the individual’s fine motor and hand-eye coordination functioning, done so by pre-cutting cardboard inserts to fit the box, use of larger scissors, facilitator or volunteer use of sharp instrument to cut hole in box top, and hand-on-hand manipulation of materials.

The concept of phototropism can be used for intellectual and psychological goals and can involve discussions about plant and human inputs for growth. Discussion themes can include factors for optimal growth, tolerance and growing differently or with a disability, role of nurturing, and the concept of light at the end of the tunnel/moving towards light/goodness. Reasoning skills, acquisition of horticulture knowledge and applications to the participant’s own life can contribute to maturation, sense of self, and sense of empowerment.

SAFETY CONSIDERATIONS: Facilitators are responsible for knowing poisonous and toxic plants and plant parts. Use of sharps may not be appropriate for some populations.

NOTES OR OTHER CONSIDERATIONS: Phototropism is a plant’s reaction to light. Light is required by all plants for growth. Positive phototropism is the reaction from photoceptors signaling the plant to grow toward the light source. Negative phototropism, also called aphotropism, causes growth away from the light; example root growth. In some plants like sunflowers, phototropism is a phenomenon with very obvious bending and behavior moving towards the light. The flower head tracks the sun’s movement throughout the day, with popular sunflower fields attracting spectators in France and other countries watching the directional movement. *Biology Dictionary* provides additional plant science information and a [quiz on phototropism](#). A [lesson from Flexbooks.ck](#) discusses tropisms – phototropism, gravitropism and thigmotropism.

Plants that show distinctive phototropic characteristics include sunflowers (*Helianthus annuus*), chrysanthemums (genus *Chrysanthemum*), hibiscus (genus *Hibiscus*), spinach (*Spinacia oleracea L.*), petunias (genus *Petunia*), as well as short day plants like rice (genus *Oryza*), cotton (*Gossypium hirsutum*) and sugarcane (*Saccharum officinarum*).

REFERENCES/ RESOURCES:

Biology Dictionary. (2017). [Phototropism](#). *Biologydictionary.net*.
Florida Department of Education. (2019). [Standards & instructional support](#). *FLDOE.org*.
GPhase. (2018). [Positive phototropism|demonstration](#). [Video].
Massachusetts Department of Elementary and Secondary Education. (2024). [Social and emotional learning in Massachusetts](#). *DOE.mass.edu*.

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TH Activity Plan form developed by Lesley Fleming, Susan Morgan and Kathy Brechner (2012), revised in 2024.