

Weekly Activities September Through May

EXPERIENCE ASTRONOMY
FIELD GUIDE

BY: LUKE GILKERSON

*The heavens declare the glory of God,
and the sky above proclaims His handiwork.*
- Psalm 19:1 -

Experience Astronomy Field Guide
By: Luke Gilkerson
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Learn more about the complete online course at ExperienceAstronomy.com.

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This Field Guide provides 33 weeks of astronomy observation activities, from the beginning of September through the end of May, with a three-week break in December for the holidays. Many activities repeat themselves to show the changes that take place in the sky over time.

The assignments listed appear in the order they are assigned through the Experience Astronomy online course. Learn more at JourneyHomeschoolAcademy.com.

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Note: This Field Guide assumes your area practices Daylight Saving Time (DST) following the current U.S. rules (which begins on the second Sunday of March and ends on the first Sunday of November). Adjust the times in this guide if your area does not practice DST or has different start and end times.

Helpful Astronomy Links

Online Course for Homeschoolers:

- ExperienceAstronomy.com – An online, interactive class with teaching videos, quizzes, activities, and more. The course uses this Field Guide.

Helps For Observation:

- JourneyHomeschoolAcademy.com/apps-stargazing – A list of fantastic (and free) websites and apps to help you observe the sky above so you really know what you're looking at.
- JourneyHomeschoolAcademy.com/sky – This weekly column from *Sky & Telescope* is a handy day-by-day activity guide for amateur astronomers.
- JourneyHomeschoolAcademy.com/latlong – This website helps you determine your latitude and longitude position on Earth.
- JourneyHomeschoolAcademy.com/sun – This website allows you to see sunrise and sunset times for your local area, as well as times when twilight will start and end.
- JourneyHomeschoolAcademy.com/moon – This website allows you to see moonrise and moonset times for your local area.

Build a Compass

The purpose of this activity is to build a compass in your yard that will help orient yourself to the cardinal directions (North, East, South, West) as you study the sky.

1. Go to JourneyHomeschoolAcademy.com/latlong and enter your street address. Find the *Longitude* number and take away the minus sign if there is one. Write that number here: _____
2. The Earth is divided into 24 time zones. Each one has a central longitude line 15° from time zone before it. On that longitude line, noon is the same as high noon (when the sun is at the meridian). You can find your time zone's longitude here: JourneyHomeschoolAcademy.com/zone. *Subtract* from your above number your time zone's center longitude number: _____
3. It takes the sun 4 minutes to go from high noon over one longitude line to high noon over the next. So multiple your above number by 4: _____
4. If the number is positive, this is the number of minutes *after* 12:00 noon that is high noon for your home. If this number is negative, this is the number of minutes *before* 12:00 noon that is high noon. Write down that time (rounded to the nearest minute): _____
5. If you're doing this activity during Daylight Savings Time, add one hour to this time. Write down that time here: _____
6. Pick a spot in your yard with as wide a view of the sky as possible.
7. Place a stick into the ground about 1 foot long. Use a level to make sure it is sticking up as straight as possible.
8. At exactly "high noon" for your location, look at the shadow cast by the stick and place another stick in the ground at the tip of the shadow.
9. Using a yard stick or a long straight edge, use the line between the first stick and the second stick to create a straight line. This is your north-south line. Place 2 sticks in the ground about 3 feet from the first stick, both north and south of it.
10. Draw a perpendicular line from this line, measuring 3 feet to the right and to the left of the first stick. Place sticks at those points. This is your east-west line.
11. You now have a compass. The direction the shadow is pointing from the center stick is North.

Moon Phases

The purpose of the Moon Phases activity is to notice the various phases and positions of the moon over the course of several weeks. You'll be outside every day to draw the moon.

Use the Internet to find out what the phase of the moon is. If the moon is in the waxing phases or full, go outside **30 minutes after sunset**. If the moon is in the waning phases, go outside **30 minutes before sunrise**. Stay outside for about 20-30 minutes.

Draw the moon with as much exact detail as you can. Don't just draw a general crescent, oval, or round shape. Note with careful detail how much of the lighted side is visible. Draw the horizon features directly below the moon, like the treetops or rooftops, so you can note the position of the moon in the sky. Note how high the moon is in the sky. If the moon is below the horizon, simply draw the twilight of the sun on horizon. If you see "earthshine" (the light of the earth faintly reflected off the "dark side" of the moon) be sure to indicate that as well.



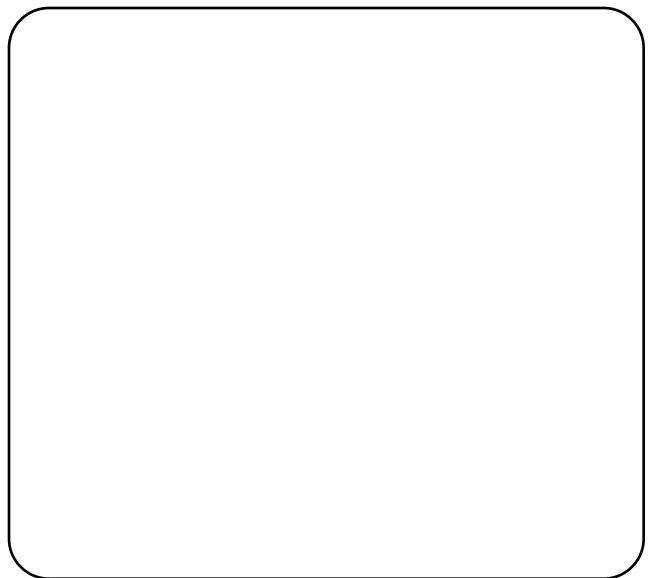
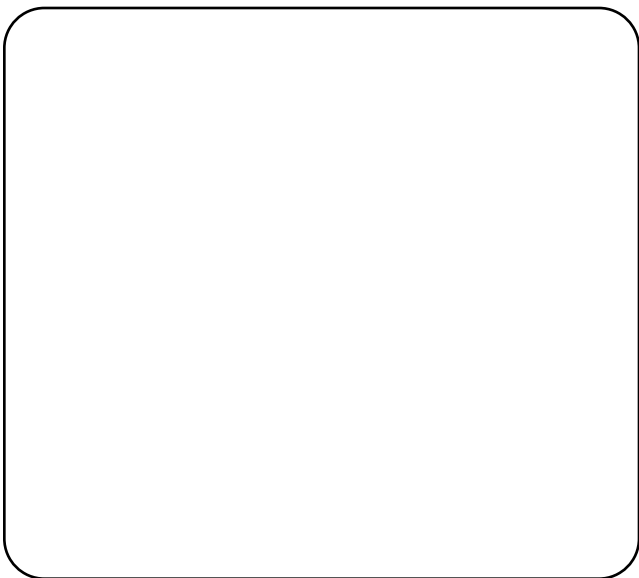
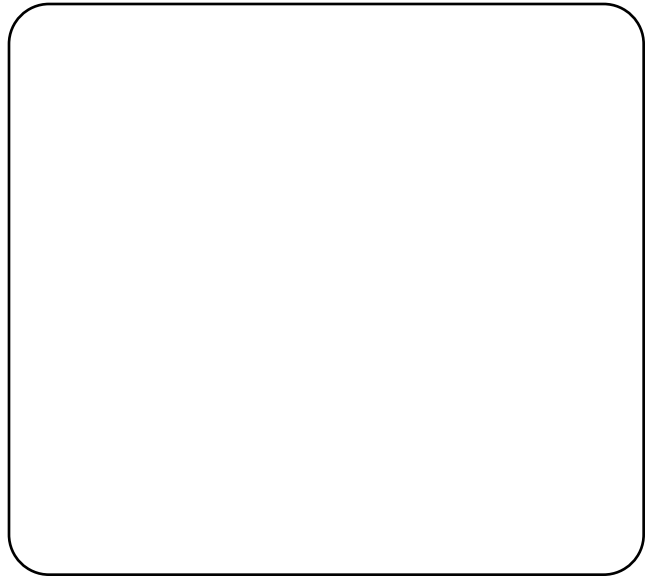
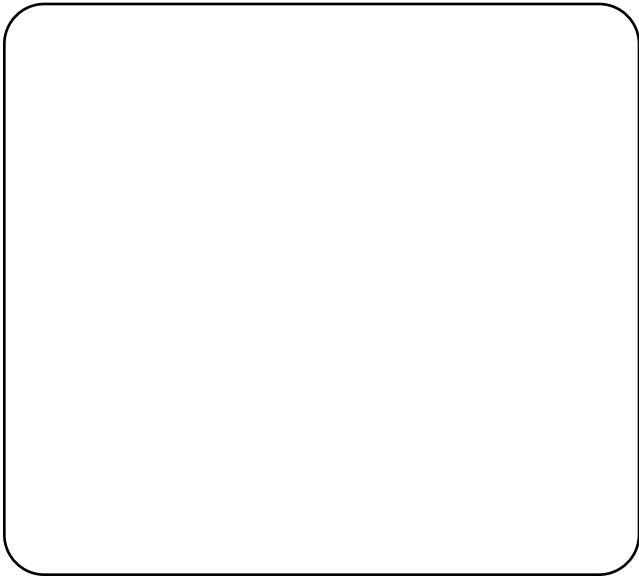
Phases of the moon



Earthshine

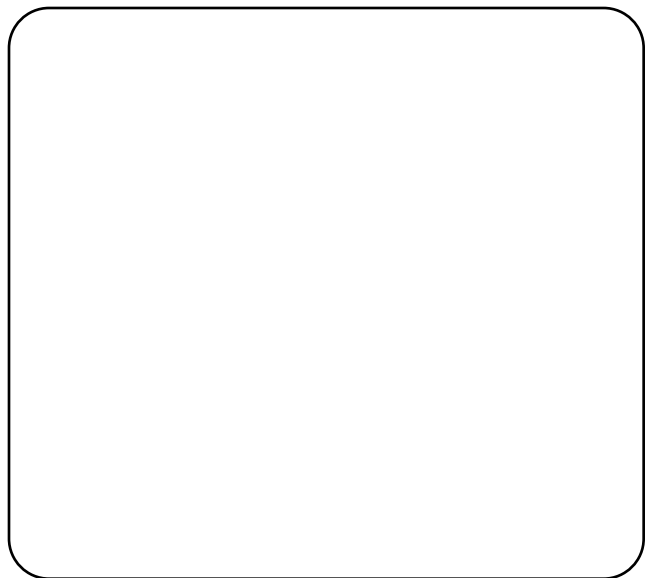
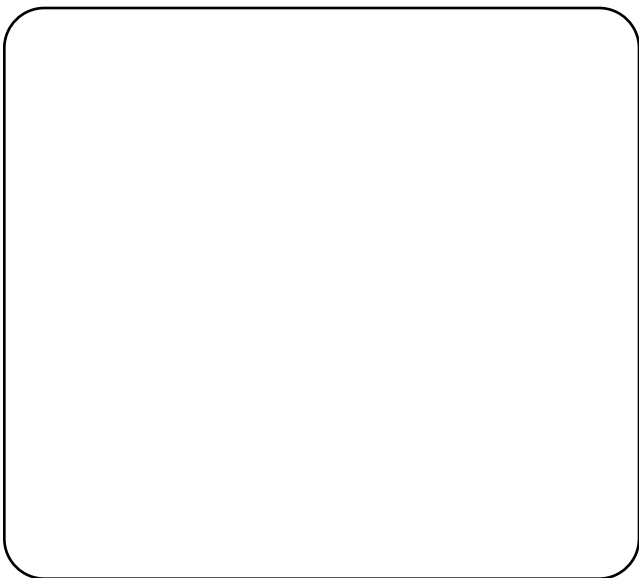
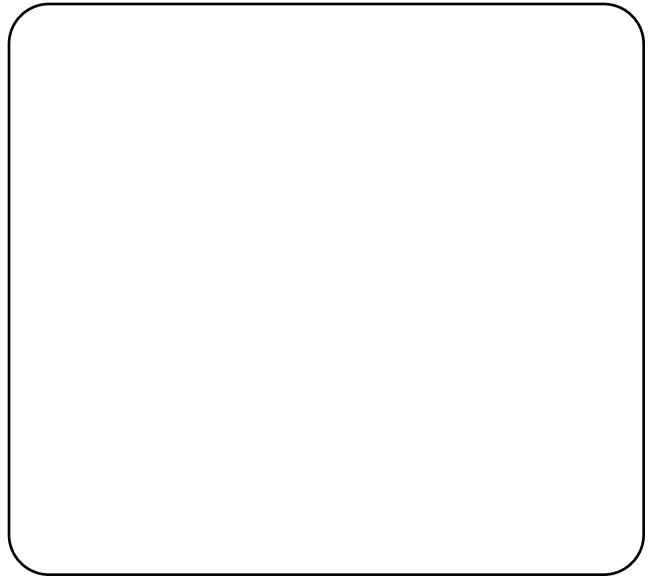
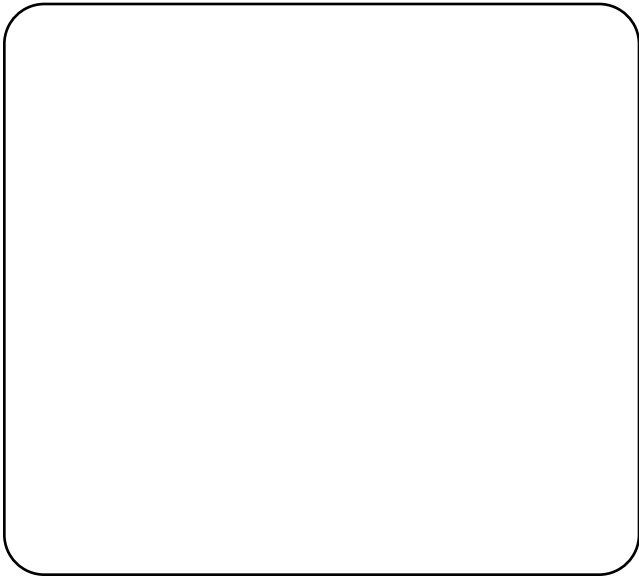
Moon Phases

Use the boxes below to draw the moon in its various phases and places in the sky.



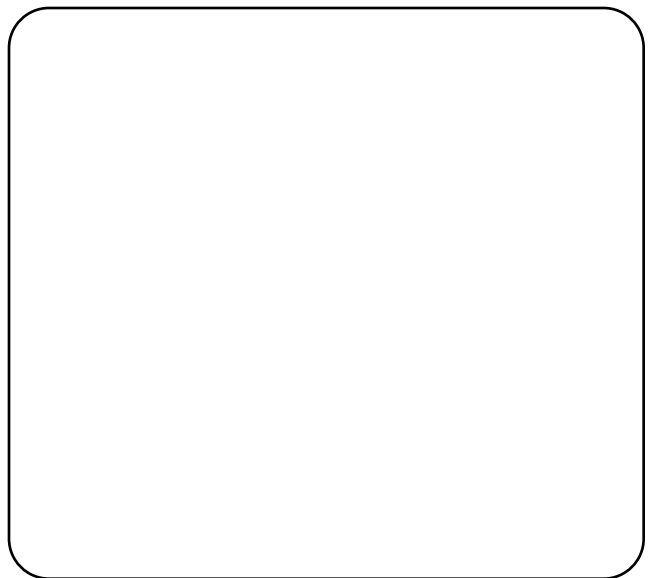
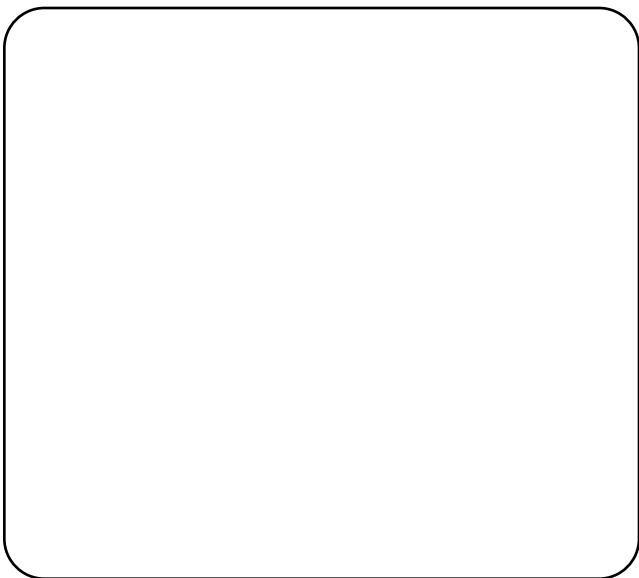
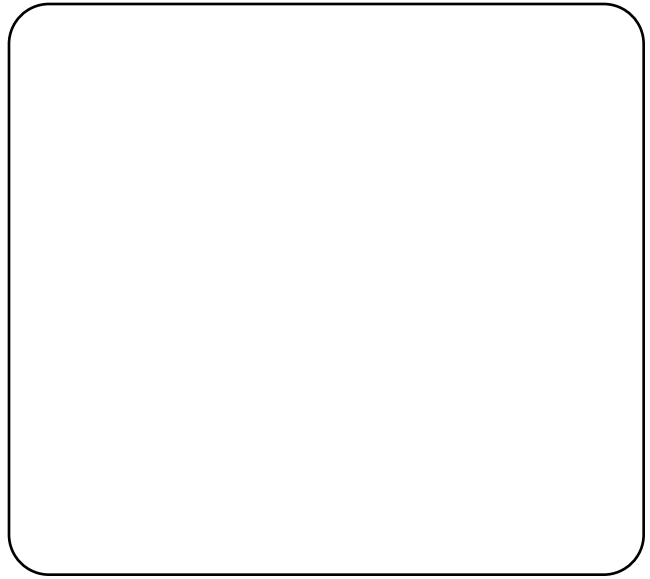
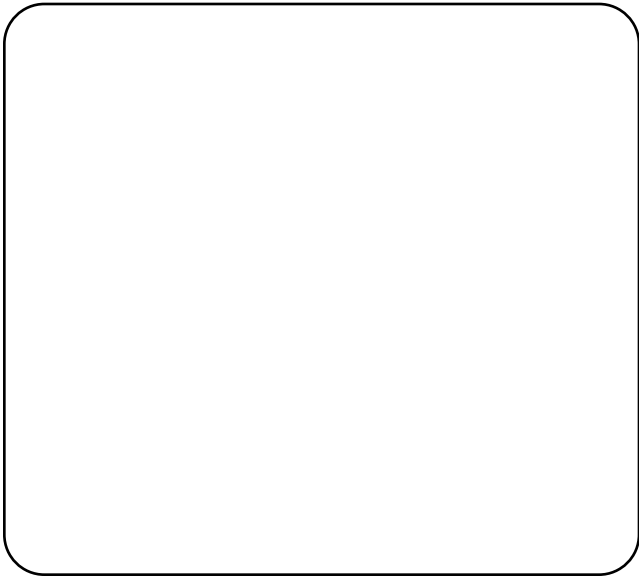
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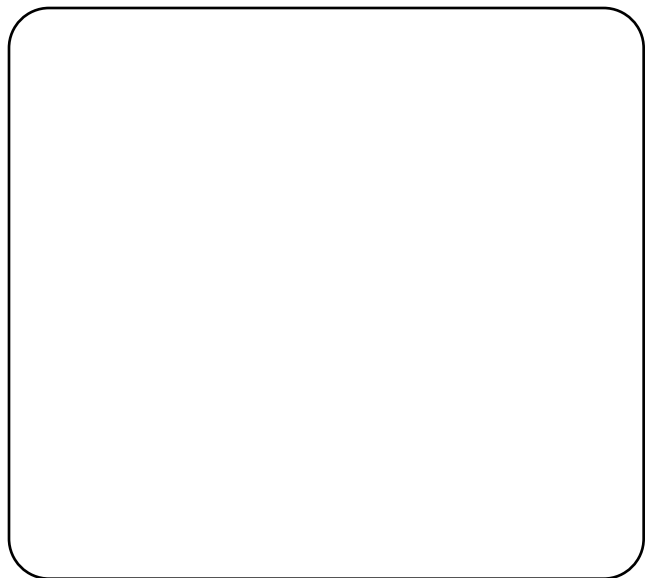
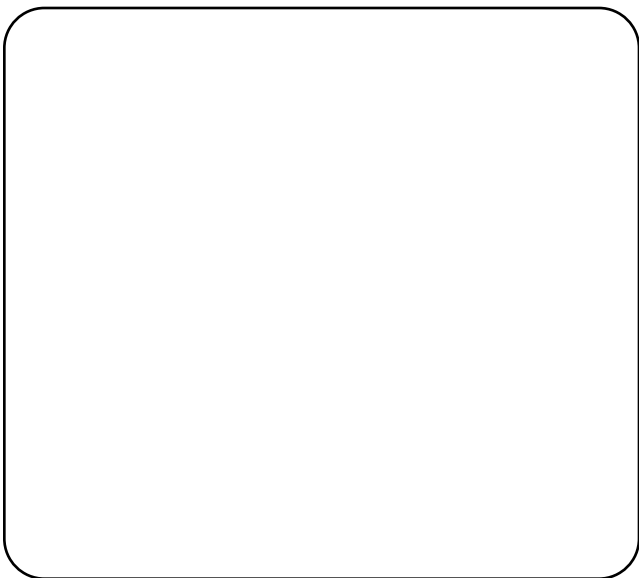
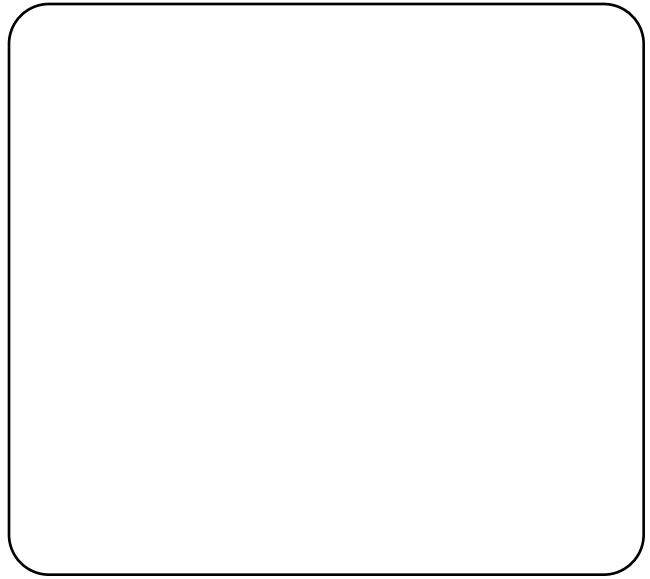
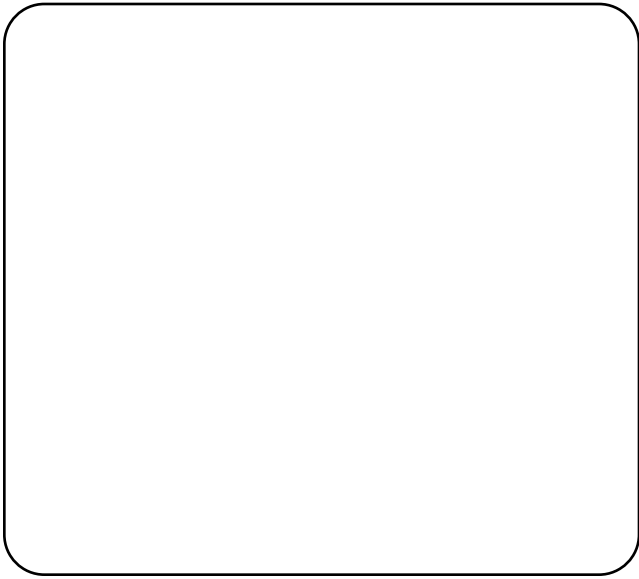
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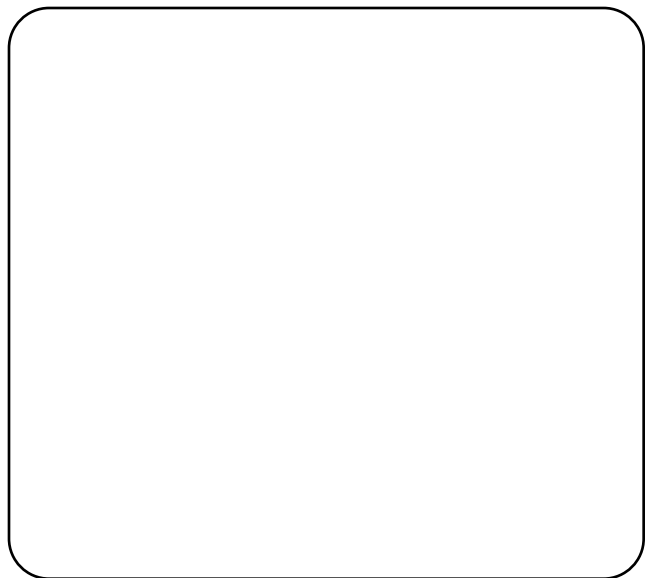
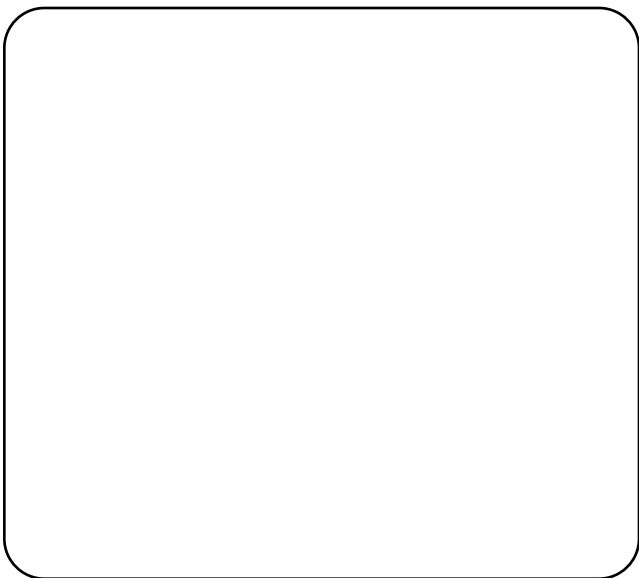
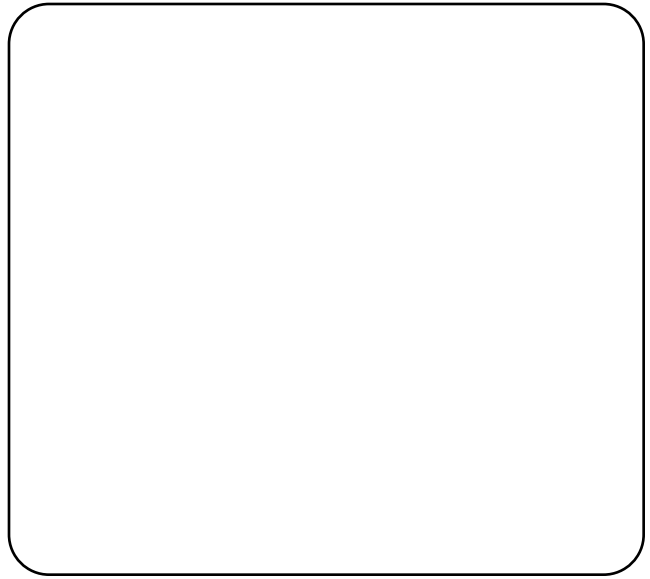
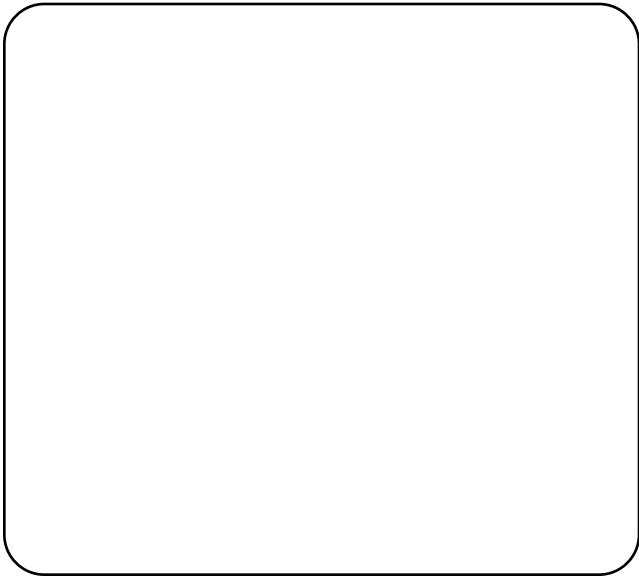
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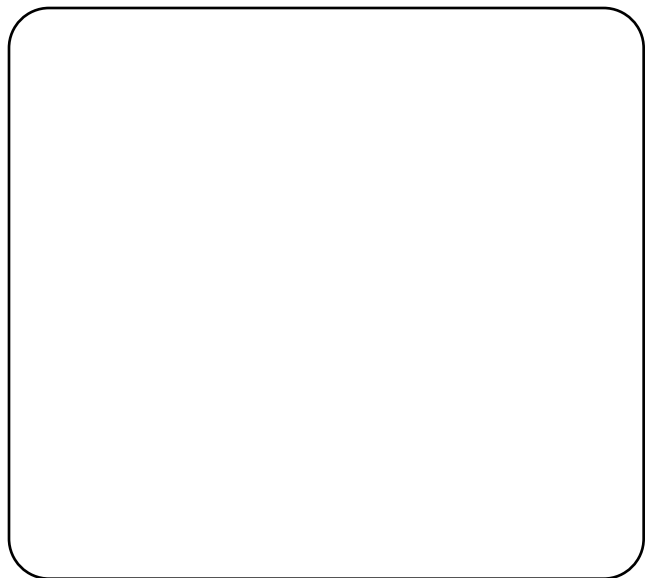
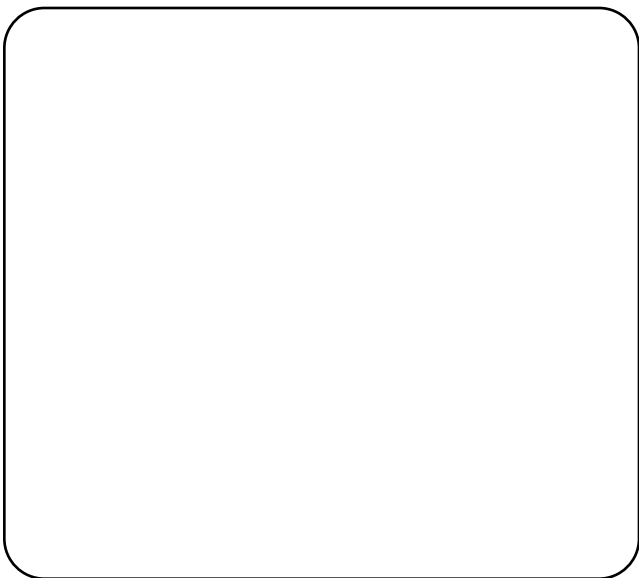
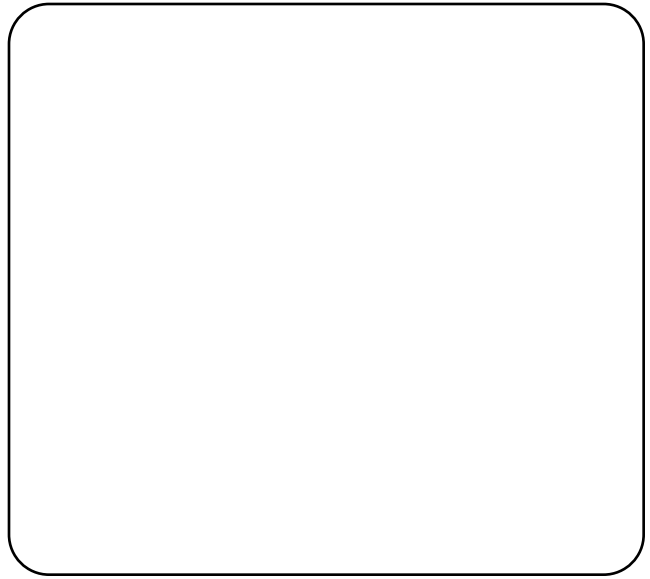
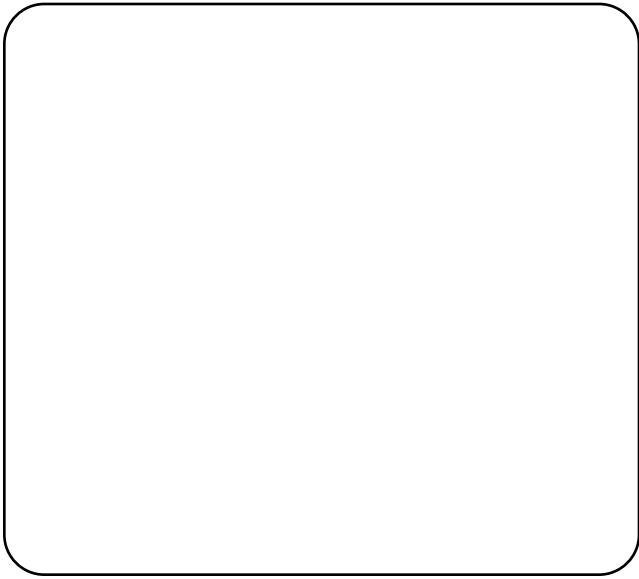
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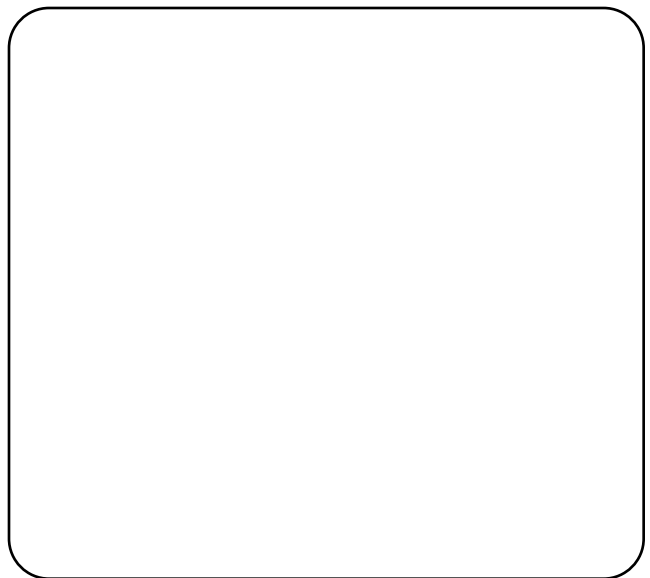
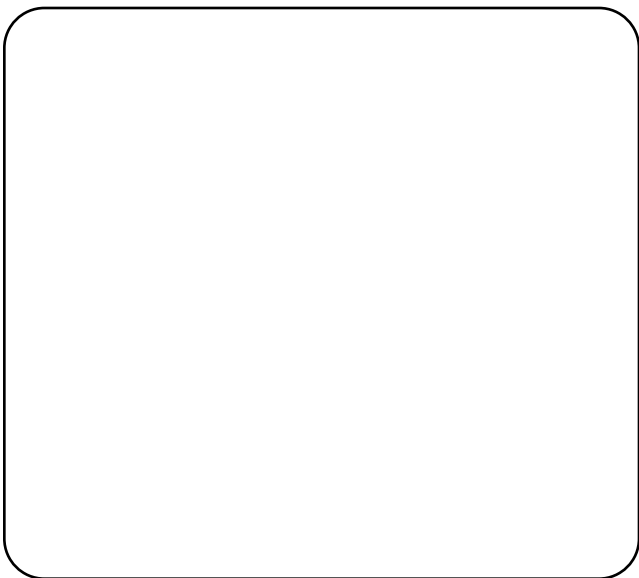
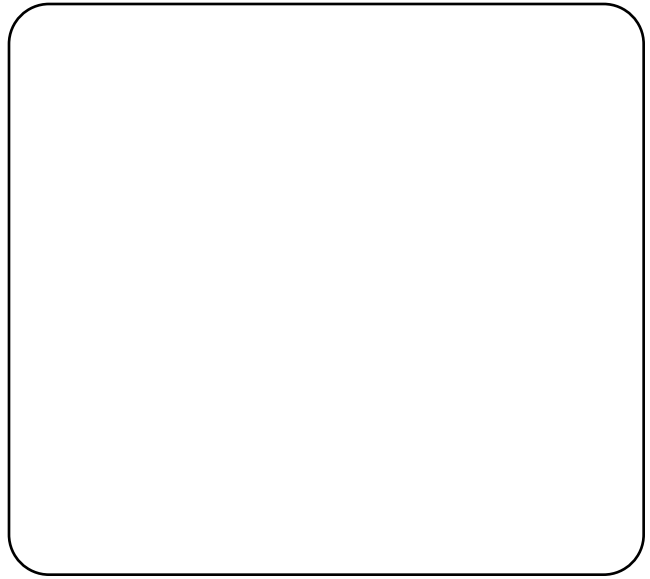
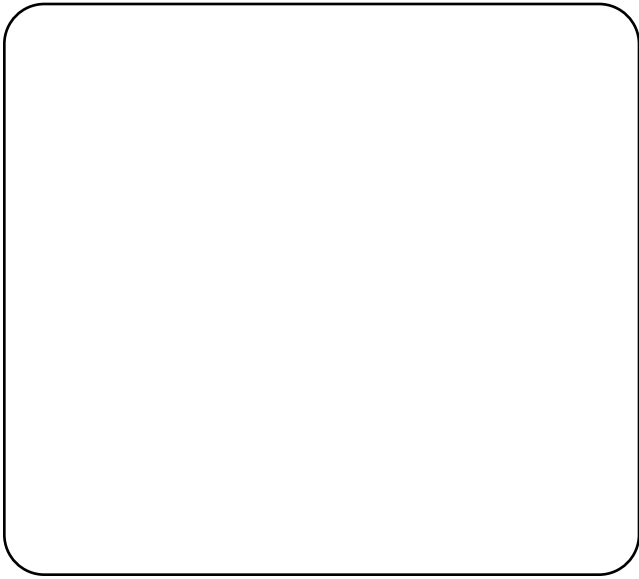
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