

# 1 GUIDE TO MAKING YOUR OWN LUNAR MAT

There are multiple ways to create your own Lunar Mat. This document contains the dimensions which can be used for any method of creating one by hand, as well as one of many potential methods to make your own for qualifying events or for team practice. The colors of the official map are based on the colors of LEGO bricks, and CMYK values can be found below.

## 1.1 Dimensions

The center point and diameter of each circle on the ANGLEs Moon Mat are given below. The diameter is measured to the outermost point of the line. The lines are each 1.05 cm thick. All center points are measured from the top left corner.

Below are the landing zone and drop zone circles, along with the radials. The black circle at the very center of the drop zone is not for scoring.

Feature color	Feature Name	Feature Center Point (x,y) (in)	Feature Diameter (in)
Black	Landing Zone Center Circle	26.37, -41.29	3
Blue	Landing Zone: Circle 1	26.35, -41.21	10
Blue	Landing Zone: Circle 2	26.35, -41.21	20
Blue	Landing Zone: Circle 3	26.35, -41.21	30
Blue	Landing Zone: Circle 4	26.35, -41.21	40
Yellow	Landing Zone Radials	Start at center circle and extend to outermost landing circle. Radials are 60° apart.	
Green	Drop Zone Circle 1	68.92, -17.55	3
Green	Drop Zone Circle 2	68.92, -17.55	6
Green	Drop Zone Circle 3	68.92, -17.55	9



All craters have a red outline. In order to make them more noticeable, craters also have additional shaping on the inside. This effect was created on the computer by putting a dashed circle just inside the solid circle.

Feature color	Feature Name	Feature Center Point (x,y) (in)	Feature Diameter (in)
Red	Crater - Danger Zone 1	35.70, -77.90	4
Red	Crater - Danger Zone 2	36.08, -40.70	6
Red	Crater - Danger Zone 3	50.59, -11.92	5
Red	Crater - Danger Zone 4	60, -35.96	5
Red	Crater - Danger Zone 5	74.97, -28.14	5
Red	Crater - Danger Zone 6	82.97, -80.55	6
Red	Crater - Danger Zone 7	85.87, -18.78	5
Red	Crater - Danger Zone 8	101.97, -56.52	25
Red	Crater - Danger Zone 9	107.44, -12.96	3

The circles and dots given below are for rock identification and sampling. The blue circle titled “clue zone” will be the location of the randomized color-coded marker to communicate which rock sample to collect. This is a circle, and is not filled in. The dots are color coded to the corresponding “rock sample” to be placed on this location.

Feature color	Feature Name	Feature Center Point (x,y) (in)	Feature Diameter (in)
Blue	Circle - Clue Zone - Blue	100.57, -33.23	5
Blue	Dot - Rock Sample - Blue	96.35, -76.81	1
Green	Dot - Rock Sample - Green	99.62, -81.88	1
Yellow	Dot - Rock Sample - Yellow	103.45, -77.38	1

## 1.2 Color specifications

Color	LEGO Number	LEGO Color name	CMYK Values
Red	LegoNo. 21	“Bright Red”	0, 100, 100, 0
Blue	LegoNo. 23	“Bright Blue”	100, 47, 0, 0
Yellow	LegoNo. 24	“Bright Yellow”	0, 19, 100, 0
Green	LegoNo. 37	“Bright Green”	88, 0, 100, 0



## 1.3 Suggested Materials

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- White Butcher Paper
- Markers
- Pencil
- String
- Meter stick
- Protractor

## 1.4 Drawing method

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For each circle or dot:

1. Use the meter stick to measure out the center location.
  - a. For the most precision, measure along the edges of the paper to ensure that your measurements are square. It may also help to measure the 'x' values on both the top and bottom edges of the paper and sketch a line, then measure the 'y' values along that line.
2. Tie some string to the pencil and cut it to the radius length of the circle ( $\frac{1}{2}$  diameter).
3. Hold the free end of the string down at the center location, and trace a circle with the pencil (This may take two people!).
  - a. For the inner line, hold the string 1.05 cm from the end, still at the center of the circle, then draw the circle in the same way.
4. When you finish drawing a circle, label it with the color it should be colored in pencil, between the two sketched boundaries.

Drawing the radials:

1. In pencil, sketch one line parallel to the short edge that goes through the center of the landing circles. Use the protractor to mark  $60^\circ$  increments around the circle. Using the meter stick, sketch two more lines going all the way through the landing target to line up with the  $60^\circ$  marks.
2. Measure about 0.5 cm to the side of each radial sketch to find the boundary for coloring them in.

Once you have sketched all of the features of the map, color them in with the corresponding color. For the most accuracy, color the yellow radials first, then color the landing target circles around the radials.

