
STEMonstrations
MOON PHASES
NASA
ANNE McCLAIN
EXPLORE
HUMANS in SPACE
Leading Discovery, Improving Life on Earth

1
00:00:03,420 --> 00:00:24,150
[Music]

2
00:00:28,390 --> 00:00:26,550
hi there my name is ann mclean and i'm

3
00:00:30,390 --> 00:00:28,400
an astronaut who has lived and worked

4
00:00:32,549 --> 00:00:30,400
250 miles above the earth's surface on

5
00:00:34,229 --> 00:00:32,559
the international space station

6
00:00:35,990 --> 00:00:34,239
today we're going to be turning our eyes

7
00:00:38,229 --> 00:00:36,000
toward the moon and learning more about

8
00:00:39,910 --> 00:00:38,239
what causes the moon phases but before

9
00:00:41,350 --> 00:00:39,920
we check out the moon phases let's take

10
00:00:42,790 --> 00:00:41,360
a look at where the space station is

11
00:00:45,750 --> 00:00:42,800
compared to where we are on earth and

12
00:00:48,069 --> 00:00:45,760
where the moon and the sun are

13
00:00:49,510 --> 00:00:48,079

on earth you're only about 250 miles

14
00:00:53,549 --> 00:00:49,520
below the station

15
00:00:56,869 --> 00:00:53,559
the moon however is located 238

16
00:01:00,069 --> 00:00:56,879
8555 miles on average from earth

17
00:01:02,069 --> 00:01:00,079
you could fit 30 earths in that distance

18
00:01:03,990 --> 00:01:02,079
when you think about how far away we are

19
00:01:06,390 --> 00:01:04,000
from you on the station versus how far

20
00:01:08,310 --> 00:01:06,400
away the moon is the station is only a

21
00:01:09,590 --> 00:01:08,320
tiny bit closer to the moon than we are

22
00:01:11,429 --> 00:01:09,600
here on earth

23
00:01:13,270 --> 00:01:11,439
and that's only when the station is in

24
00:01:14,070 --> 00:01:13,280
orbit on the same side of earth as the

25
00:01:16,950 --> 00:01:14,080
moon

26
00:01:21,990 --> 00:01:16,960
so the station is 250 miles away the

27
00:01:23,670 --> 00:01:22,000
moon is 238 855 miles away and the sun

28
00:01:27,109 --> 00:01:23,680
is approximately

29
00:01:30,390 --> 00:01:27,119
92 million 900 000 miles away

30
00:01:32,149 --> 00:01:30,400
that is quite the distance

31
00:01:34,310 --> 00:01:32,159
now that you know where you are relative

32
00:01:36,230 --> 00:01:34,320
to the station moon and the sun let's

33
00:01:37,429 --> 00:01:36,240
talk about the moon phases

34
00:01:38,630 --> 00:01:37,439
now when you're looking up at the moon

35
00:01:40,390 --> 00:01:38,640
from the earth you'll notice that it

36
00:01:42,149 --> 00:01:40,400
looks different from day to day

37
00:01:44,069 --> 00:01:42,159
we call these differences the phases of

38
00:01:45,270 --> 00:01:44,079

the moon and they cycle through every 30

39
00:01:46,789 --> 00:01:45,280
days

40
00:01:48,870 --> 00:01:46,799
let's check out a demonstration of the

41
00:01:51,429 --> 00:01:48,880
moon phases here on the ground

42
00:01:53,510 --> 00:01:51,439
we're going to pretend his head is earth

43
00:01:55,109 --> 00:01:53,520
letting him view the moon as you would

44
00:01:56,709 --> 00:01:55,119
from your home

45
00:01:58,789 --> 00:01:56,719
the ball in their hand is going to

46
00:02:00,950 --> 00:01:58,799
represent the moon and the light source

47
00:02:03,109 --> 00:02:00,960
is going to be our sun keep in mind that

48
00:02:05,590 --> 00:02:03,119
while the moon is orbiting earth earth

49
00:02:07,429 --> 00:02:05,600
is also rotating on its axis and slowly

50
00:02:09,350 --> 00:02:07,439
orbiting the sun

51
00:02:11,589 --> 00:02:09,360
now looking from our outsider

52
00:02:13,270 --> 00:02:11,599
perspective we can see the moon is still

53
00:02:16,229 --> 00:02:13,280
whole the entire time it is orbiting

54
00:02:17,910 --> 00:02:16,239
around earth with a side facing the sun

55
00:02:19,830 --> 00:02:17,920
always illuminated and reflecting

56
00:02:22,790 --> 00:02:19,840
sunlight

57
00:02:24,150 --> 00:02:22,800
let's take a look at what he is seeing

58
00:02:26,229 --> 00:02:24,160
as you can see in the photographs from

59
00:02:28,630 --> 00:02:26,239
earth's view the reflection of sunlight

60
00:02:30,470 --> 00:02:28,640
looks quite different from this angle

61
00:02:32,630 --> 00:02:30,480
since we are only able to see parts of

62
00:02:34,869 --> 00:02:32,640
the reflected sunlight as the moon moves

63
00:02:36,949 --> 00:02:34,879

around earth this is what causes our

64
00:02:40,309 --> 00:02:36,959
moon phases as the moon orbits around

65
00:02:41,990 --> 00:02:40,319
earth every 30 days

66
00:02:43,910 --> 00:02:42,000
there are names for each of the phases

67
00:02:45,990 --> 00:02:43,920
of the moon's 30-day cycle when the moon

68
00:02:47,350 --> 00:02:46,000
looks completely dark we're experiencing

69
00:02:48,869 --> 00:02:47,360
a new moon

70
00:02:51,270 --> 00:02:48,879
this is the beginning of the 30-day

71
00:02:53,030 --> 00:02:51,280
cycle it will move through a waxing

72
00:02:54,630 --> 00:02:53,040
crescent phase until it is a first

73
00:02:56,869 --> 00:02:54,640
quarter moon

74
00:02:59,430 --> 00:02:56,879
from here we will see a waxing gibbous

75
00:03:01,750 --> 00:02:59,440
until the moon appears fully illuminated

76
00:03:04,630 --> 00:03:01,760
you might have heard this phase before

77
00:03:06,630 --> 00:03:04,640
this is what we call a full moon

78
00:03:08,550 --> 00:03:06,640
after this phase the moon will go from a

79
00:03:10,149 --> 00:03:08,560
waning gibbous phase into a third

80
00:03:13,589 --> 00:03:10,159
quarter moon

81
00:03:16,470 --> 00:03:13,599
become a waning crescent until it

82
00:03:18,309 --> 00:03:16,480
returns to a new moon

83
00:03:20,070 --> 00:03:18,319
on the space station we see the same

84
00:03:21,270 --> 00:03:20,080
moon phases as we do on the earth's

85
00:03:23,430 --> 00:03:21,280
surface

86
00:03:25,190 --> 00:03:23,440
since the space station is only 250

87
00:03:26,470 --> 00:03:25,200
miles closer to the moon than we are

88
00:03:28,070 --> 00:03:26,480

here on the ground

89
00:03:29,910 --> 00:03:28,080
astronauts on the station have the same

90
00:03:31,270 --> 00:03:29,920
perspective you have but don't have the

91
00:03:33,190 --> 00:03:31,280
earth's atmosphere in their way for

92
00:03:34,949 --> 00:03:33,200
photographs astronauts currently on the

93
00:03:36,470 --> 00:03:34,959
space station actually use the moon's

94
00:03:38,949 --> 00:03:36,480
phases to collect research that will

95
00:03:40,710 --> 00:03:38,959
help nasa with the artemis program as we

96
00:03:43,430 --> 00:03:40,720
work to go forward to the moon with our

97
00:03:45,509 --> 00:03:43,440
astronauts by 2024

98
00:03:47,030 --> 00:03:45,519
so the next time you're outside take a

99
00:03:48,229 --> 00:03:47,040
glance up at the moon to check out what

100
00:03:49,430 --> 00:03:48,239
phase it's in

101
00:03:51,110 --> 00:03:49,440
are you interested in seeing the space

102
00:03:52,630 --> 00:03:51,120
station fly by as well

103
00:03:54,149 --> 00:03:52,640
ask an adult to help you sign up for

104
00:03:56,630 --> 00:03:54,159
spot the station at spot the

105
00:03:58,149 --> 00:03:56,640
station.nasa.gov

106
00:04:00,320 --> 00:03:58,159
thanks for learning with me today see

107
00:04:22,310 --> 00:04:00,330
you next time

108
00:04:31,110 --> 00:04:24,860
subscribe for more space