

Parshas Lech Lecha - The Number of Stars

Lesson Plan: Presenting the beauty of Torah that it contains all the wisdoms of the world in it. Emphasizing Hashem can be clearly seen from the Torah itself:

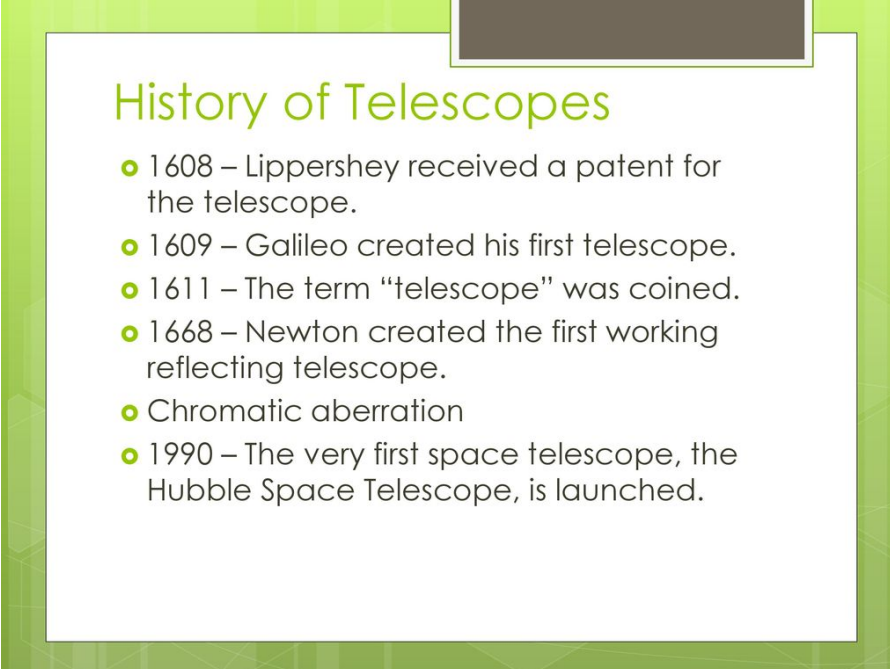
Step 1: Build up the concept that until the year 1600 there were no telescopes and people were only able to see what was visible in the sky. Therefore any knowledge of distant galaxies would be impossible. You can go through the history of the telescope until the Hubble Telescope which changed the world's perspective on the universe.

Step 2: Show how many stars astrologers thought existed within the universe vs. how many they think exist now.

Step 3: Share what the Gemara says about how many stars there are, clearly explaining how you got to that mathematical calculation.

Step 4: Emphasize the Torah's advanced knowledge which must be Divine.

Step 5: Show the Divine Fingerprints Video.



History of Telescopes

- 1608 – Lippershey received a patent for the telescope.
- 1609 – Galileo created his first telescope.
- 1611 – The term “telescope” was coined.
- 1668 – Newton created the first working reflecting telescope.
- Chromatic aberration
- 1990 – The very first space telescope, the Hubble Space Telescope, is launched.

Teach to Reach is under the guidance of:

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The total number of individual stars visible in both the northern and the southern celestial hemispheres is about 6,000. Thus, on a clear night one can see at most 3,000 stars at the same time. Is that all? With the advent of telescopes, many previously unknown stars were discovered. Galileo (1564–1642), using his homemade telescope, saw a ten-fold increase in the number of visible stars, up to 30,000. Today, the local Milky Way galaxy has been found to contain 200,000 million stars. What an astounding result! Can we really grasp such an immense size? And this is not the only galaxy. With the naked eye we can see three more, namely the two Clouds of Magellan near the southern celestial pole, and the Andromeda galaxy in the constellation of the same name.

Numerous other galaxies have been discovered by means of the prolonged exposure of photographic plates. The total number discovered thus far is probably in the region of several hundred thousand million, and it may even amount to a few million million. The total number of stars in the observable universe is nowadays estimated to be 10,000,000,000,000,000,000,000,000 but nobody knows the actual number.

בראשית טו:ה - וַיֵּצֵא אֱלֹהִים הַחוּצָה וַיֹּאמֶר הַבִּטְנָה הַשָּׁמַיְמָה וּסְפֹר הַכּוֹכָבִים אִם־תּוּכַל לִסְפֹּר אֹתָם וַיֹּאמֶר לוֹ כֹּה יִהְיֶה זְרַעְךָ:
 [Then in the vision, G-d] took him outside and said, “Look toward heaven and count the stars, if you are able to count them”—continuing, “So shall your offspring be.”

ברכות לב

אָמַר לָהּ הַקָּדוֹשׁ בְּרוּךְ הוּא: בְּתִי, שְׁנַיִם עָשָׂר מְזֻלוֹת בְּרָאִתִּי בְּרִקְיעִי, וְעַל כָּל מְזֻל וּמְזֻל בְּרָאִתִּי לוֹ שְׁלֹשִׁים חֵיל, וְעַל כָּל חֵיל וְחֵיל בְּרָאִתִּי לוֹ שְׁלֹשִׁים לִגְיוֹן, וְעַל כָּל לִגְיוֹן וְלִגְיוֹן בְּרָאִתִּי לוֹ שְׁלֹשִׁים רֵהָטוֹן, וְעַל כָּל רֵהָטוֹן וְרֵהָטוֹן בְּרָאִתִּי לוֹ שְׁלֹשִׁים קָרְטוֹן, וְעַל כָּל קָרְטוֹן וְקָרְטוֹן בְּרָאִתִּי לוֹ שְׁלֹשִׁים גָּסְטָרָא, וְעַל כָּל גָּסְטָרָא וְגָסְטָרָא תְּלִיתִי בּוֹ שְׁלֹשׁ מֵאוֹת וְשָׁשִׁים וְחֲמִשָּׁה אֲלֵפֵי רַבּוּא כּוֹכָבִים כְּנֶגֶד יְמוֹת הַחֲמָה. וְכוּלֵן לֹא בְּרָאִתִּי אֶלָּא בְּשִׁבְלֵךְ, וְאֵת אֲמַרְתָּ “עֲזַבְתִּנִּי” וְיִשְׁכַּחְתִּנִּי”

The Holy One, Blessed be He, said to Israel: My daughter,

- I created twelve constellations in the firmament,
- and for each and every constellation I have created thirty hosts,
- and for each and every host I have created thirty legions [ligyon],
- and for each and every legion I have created thirty divisions [rahaton],
- and for each and every division I have created thirty battalions [karton],
- and for each and every battalions I have created thirty camps [gastera],
- and on each and every camp I have hung three hundred and sixty-five thousand tens of thousands of stars corresponding to the days of the solar year. And all of them I have created only for your sake; and you said the Lord has forsaken me and the Lord has forgotten me?

Calculate:

- $1000 \times 10,000 \text{ stars} = 10,000,000$
- Each camp has $365 \times 10,000,000 \text{ stars} = 3,650,000,000$
- How many camps are there? $30 \text{ camps} \times 30 \text{ battalions} \times 30 \text{ divisions} \times 30 \text{ legions} \times 30 \text{ hosts} \times 12 \text{ constellations} = 291,600,000 \text{ camps}$
- Total stars = $291,600,000 \times 3,650,000,000 = 1,064,340,000,000,000,000$

The Gemara Indicated The Number Of Stars In The Universe Many Years Before Science.

How Beautiful Is Our Torah That It Contains All The Wisdom Of The World!

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