

From the Earth to the Moon, and Beyond!

VIDEO TEXT REFERENCE

Bryan Mills:

Hi, and welcome to the Indianapolis Symphony Orchestra's Discovery Concert Series. My name is Bryan Mills. I serve as the President and CEO of Community Health Network, and I'm delighted to once again have Community be the Title Sponsor for this amazing series. This is something we've done for many years, and it's just part of the investment we make with schools as a partner to focus on education, and focus on health, and with this, focusing on the arts. And this amazing program is year long, and there is so much that is created for students 3rd - 6th grade, about 18,000 students a year. And in the good days, we can't do it now (this is virtual) but all these buses would go downtown to The Circle and we'd see this concert live! And we'll do that again. but what we're really trying to do is, we're trying to introduce young kids to the arts and the understanding of how this applies to so many things in life. Today we're just going to enjoy this time together, and I appreciate you joining us. Thank you.

Jacob:

Hey everyone! My name is Jacob, and I have the coolest job in the world. I get to be a conductor. That means that I'm around the arts every single day. I'm constantly surrounded by music, dance, and visual art. But here's a little secret: I actually also really love science. Now when I was your age growing up, I was confused because it felt like the arts and sciences were totally separate. They were in different classes, taught by different teachers, in different parts of the building. Now that I'm all grown up, I'm not so sure that they're so separate after all. But I want to know what you guys think, so wherever you are let's take a quick poll. If you had to spend your entire day in one class how many of you would choose the arts...and how many of you would choose science? Now, I just made you choose...but do we really have to pick? Maybe they're not so different after all. Let's keep this question in mind as we go on our musical journey from the Earth, to the Moon, and beyond!

(MUSICAL PERFORMANCE)

Cora Walker:

Hi! I'm Cora Walker, and I'm an 8th grader at Paul Hadley Middle School in Mooresville. I play violin. My favorite subjects in school are biology, algebra, and choir. There is definitely a relationship between science and art. They're different, but they're both really forms of art. You know when you're making a scientific discovery it is an artform. You have to be really good at it, and it takes very creative minds to come up with ideas of how to discover something. Learning a new piece you go in steps. You look at rhythm, and then you look at notes, and then you look at bowings, and not necessarily in that order always, but you have to take it piece by piece. And with a math problem, you know, you do your first step, and then your second step, and you break it down piece by piece...which is exactly what you do in music. I want to be, well, I'm going to be an astronaut. And I've never really understood why...it's just like it was calling me, and it was like, "Come! Be an astronaut." And it's like, I don't know...It's just...I've always wanted to. It's going to be really hard to get there. But I know I can do it, and there's other people out there in the world that can do it, and that will do it, and they'll be my future crewmates.

Jacob:

Cora will soon be an astronaut flying out of this world on a high-tech spacecraft. Maybe she'll even be the first human to make it to the planet Mars.

(MUSICAL PERFORMANCE)

Barrett Caldwell:

My name is Barrett Caldwell. I'm a professor of Industrial Engineering at Purdue University. I also have a courtesy appointment in the School of Aeronautics and Astronautics, and I'm Director of the NASA Indiana Space Grant Consortium. It was Christmas Eve 1968 when Apollo 8 was orbiting the Moon. This was the first time that humans had ever left Earth orbit. And the Apollo 8 astronauts had a Christmas Eve message: To all the people on the good Earth, Merry Christmas, good night! And...I'm about to tear up...It was that moment watching that broadcast that I said, "I want to do that with my life. I want to be an astronaut. I want to work for NASA. I want to be an Engineer. I want to do all those things." Lots of kids stayed up Christmas Eve waiting for Santa...all I cared about was astronauts around the moon. I think that the arts and the sciences have a lot to do with each other. They live in different places. Science and Engineering have a solution process associated with them. Art is about an experience. An emotional experience. There is a lot of technical aspect of producing it, and if you're working on resonance in a concert hall or the chemical composition of paints, obviously there's a lot of science and engineering that goes into that. But what you're trying to do is to evoke emotion.

Jacob:

The last piece you heard was composed by a composer who was using music to describe a real-life object. Some composers are inspired to write a little differently though. This next piece is by a composer who was writing about how he felt and what his emotions were when he looked up at this mystical object that he wondered whether mankind would ever reach: the Moon.

(MUSICAL PERFORMANCE)

Jim Beckel:

My name is Jim Beckel, and I'm the former Principal Trombonist of the Indianapolis Symphony - a position that I held for 49 years. Yes, I was contacted by the librarian from the Boston Symphony who asked me to write this piece for orchestra with narration. And I was very excited to do this to commemorate the 50th anniversary of the moon landing. I mean, I have been just such a fan of our space program and all of that...so to be able to put music to those concepts and ideas was just really exciting for me. The first chore in the project was to come up with the words that would appropriately express, you know, what has occurred with that great accomplishment by astronauts and mankind. So, I spent actually about seven months writing the script - researching, looking into astrophysics books for dummies, and all of that...and tried to combine not just the idea of that moment when we landed on the moon, but what led up to it and what it means for us going forward. The accomplishments that have occurred from that great achievement and all of that. And then once I had the texts written it was within my job to put music that would appropriately reflect those words.

I think art and science are actually entwined. When you look at the history of our civilization they have always kind of grown in similar fashion as far as our understanding of our reality and the complexity of our music versus the complexity of what we now understand about quantum physics and things like that. So it is that the two are related, and I don't think the human mind could develop or would develop properly without that connection of both sides of the brain, you know, developing as we become more aware of who and what we are. I hope you enjoy the piece!

Text to the piece "From the Earth to the Moon and Beyond"

First Narration

Before the universe began there was simply nothing. Astrophysicists like Stephen Hawking believed that there was no space or time...Then there was a very special moment...when time and space...energy and matter... began in one singular moment. It is the theory that scientists call the “Big Bang.”

Second Narration

Within the first second of Creation, the universe was more than 17 thousand times hotter than our sun, expanding faster than the speed of light!!

Third Narration

Then, 250 million years later, give or take a day or two, scientists believe the first hydrogen stars began to form, ignite, and become bright. - “Let There Be Light”

Fourth Narration

From the origin of time to the creation of our planet, and the beginning of life on earth to our existence today, we have been explorers, curious about what lies beyond that next hill, mountain, or lake. From Africa to Eurasia, we traveled with that same curiosity. From North America to South America we wandered with wonderment and awe, and in 1969 with that same curiosity and wonder, we traveled to the moon. From the beginning of our existence on earth, our eyes have looked up at the night sky to see the Moon. But on July 20th, 1969, two men looked up at the night sky and saw the Earth. Neil Armstrong and Buzz Aldrin stepped onto the moon. The Eagle had landed and there was “One small step for man, one...giant ...leap...for... mankind!!”

Fifth Narration

Putting men on the moon was an achievement made possible by the greatest minds throughout history. Our understanding of the universe is constantly evolving. 3,000 years ago we thought that the earth was flat! It was not until the 6th Century B.C. that the Greek philosopher, Pythagorus, first suggested that the earth was round. Yet even the great minds of Plato and Aristotle thought that the sun revolved around the earth. It was not until the 16th Century that Nicolaus Copernicus suggested that the earth revolves around the sun. It was another 150 years before Sir Issac Newton defined the mystical properties of gravity on all things large and small...including apples. 230 years went by before Albert Einstein better clarified Newton’s laws of gravity as curvatures in space and time.

Sixth Narration

All of our knowledge is cumulative. It is the combined effort of men and women, past and present, that have enabled us to achieve great things that are bigger than any one of us. In 1969, two men stepped onto the surface of the moon, but in essence we all walked on the moon that night. As stated on a plaque left behind, “We came in peace for all mankind.”

Seventh Narration

At the height of the cold war in 1962, President John F. Kennedy inspired and challenged our nation to put men on the moon with the following words:

“We choose to go to the moon! We choose to go to the moon in this decade and do the other things not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win.”

Eighth Narration

Since putting men on the moon, we now have an international space station circling our planet. Our cell phones connect us daily to the entire world, this as a result of our space program. The Hubble telescope, launched into earth's orbit in 1990, has viewed into distant space; back in time, to the beginning of our universe, showing us stunning pictures of distant galaxies. Our understanding of reality continues to evolve and expand. When looking at earth from space there are no national borders. Conflicts that divide people become less important, and it is imperative that we work together to protect this precious...pale...blue...dot in space that is our home.

Ninth Narration

Planet Earth - we all share this world together. What we can accomplish is limited only by our imagination and will to act. In 1969, two men walked on the surface of the moon. It was one small step for man, one Incredible Leap for Mankind! From the Earth...to the Moon...and Beyond!!!

Jacob:

We've already heard some great ideas about the connection between the arts and science, but there are so many different perspectives. Let's hit the streets of Indianapolis to hear what a few more people have to say.

Person 1:

I think a relationship between art and science could be that science is like everywhere and so is art.

Person 2:

The type of like science that goes into art or music. Like the colors they use for painting or the sound of how quickly strings vibrate on an instrument. They're very closely related.

Person 3:

You have to think outside of the box for both of them. And you use math in both art and science.

Person 4:

Well, in a way, art isn't just like a painting of like some dude sitting on his couch or a painting of an apple. It can also be music. It could be a live performance of like interpretive dance...but all of that requires timing, which is math. And then also geometry, which is math. And an understanding of what happens, like if I do this, which is then science. So, they coexist and one cannot necessarily live without the other.

Person 5:

So, I think they're one and the same. Just curiosity and desire to know more and be able to do more.

Person 6:

So usually people like to separate music and science a lot, like, put them on opposite ends of the spectrum. But they do overlap in a lot of ways, and that's really cool.

Person 7:

I would say that a lot of art can be derived from science and a lot of science takes a lot of creativity to get to the right answer, maybe?

Person 8:

You can't have one without the other.

(MUSICAL PERFORMANCE)

Jacob:

So back to our original question: Do we really have to choose between the arts and science? Maybe you're someone who likes observing things and creating new systems. Maybe you're someone who likes imagining new possibilities. Maybe like me, you're a little bit of both. After today though, I'm sure that whoever you are and whatever you choose to do, you can certainly go off and change the world!