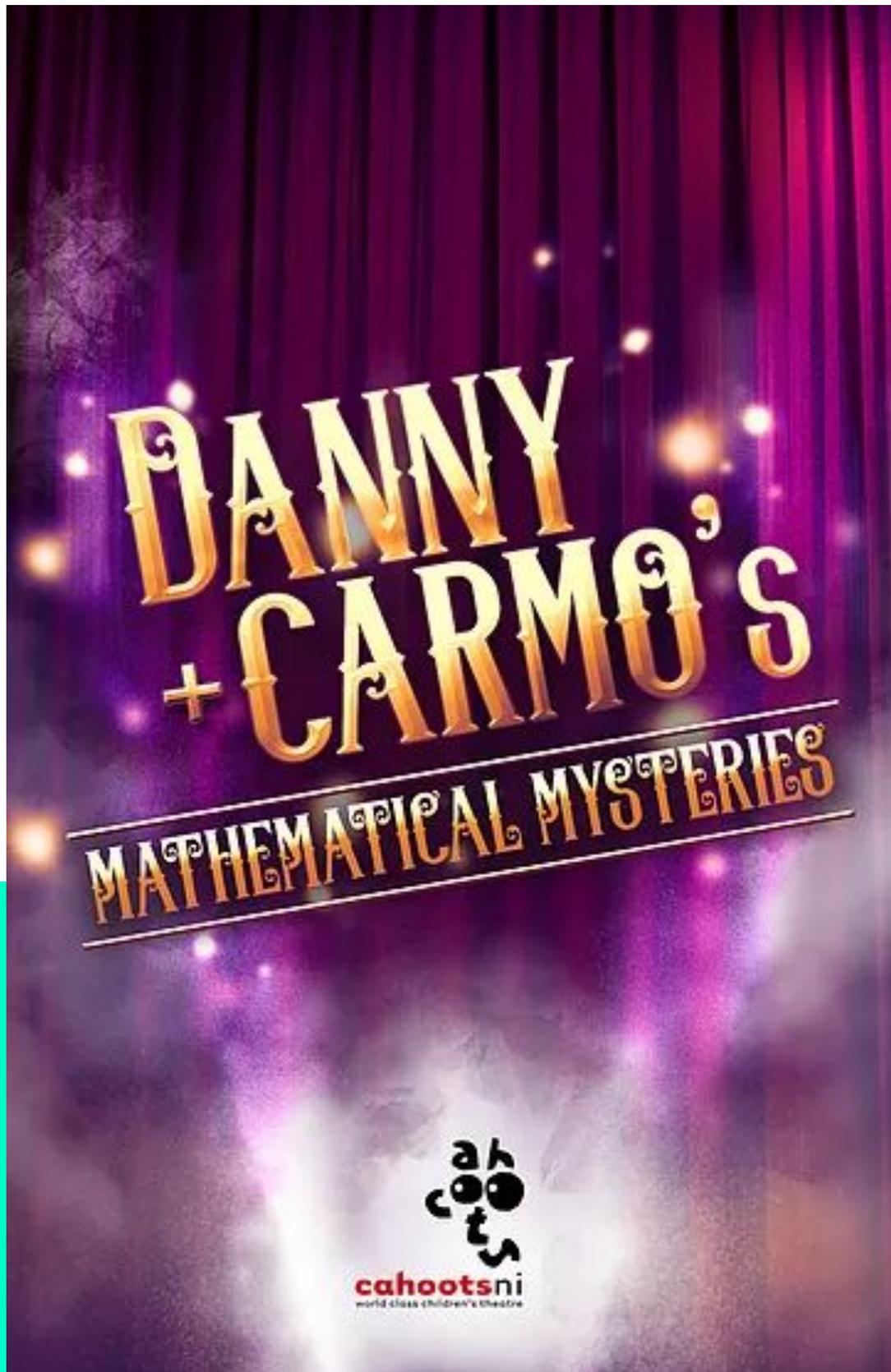


FLYNN CENTER PRESENTS



WELCOME TO THE 2018-2019 STUDENT MATINEE SEASON!

TODAY'S SCHOLARS AND RESEARCHERS SAY CREATIVITY IS THE TOP SKILL OUR KIDS WILL NEED WHEN THEY ENTER THE WORKFORCE OF THE FUTURE, SO WE SALUTE YOU FOR VALUING THE EDUCATIONAL AND INSPIRATIONAL POWER OF LIVE PERFORMANCE. BY USING THIS STUDY GUIDE YOU ARE TAKING AN EVEN GREATER STEP TOWARD IMPLEMENTING THE ARTS AS A VITAL AND INSPIRING EDUCATIONAL TOOL.

WE HOPE YOU FIND THIS GUIDE USEFUL AND THAT IT DEEPENS YOUR STUDENTS' CONNECTION TO THE MATERIAL. IF WE CAN HELP IN ANY WAY, PLEASE CONTACT SMS@FLYNNCENTER.ORG.

ENJOY THE SHOW! -Education Staff

AN IMMENSE THANK YOU...

THE FLYNN CENTER RECOGNIZES THAT FIELD TRIP RESOURCES FOR SCHOOLS ARE EXTREMELY LIMITED, THUS MATINEE PRICES FOR SCHOOLS ARE SIGNIFICANTLY LOWER THAN PRICES FOR PUBLIC PERFORMANCES. AS A NON-PROFIT ORGANIZATION, THE FLYNN IS DEEPLY GRATEFUL TO THE FOUNDATIONS, CORPORATIONS, AND INDIVIDUALS WHOSE GENEROUS FINANCIAL SUPPORT KEEPS MATINEES AFFORDABLE FOR SCHOOLS.

THANK YOU TO BRUCE AND RUTH ANN BEERS FOR SPONSORING THIS PERFORMANCE.

THANK YOU TO THE FLYNN MATINEE 2018-2019 UNDERWRITERS:

NORTHFIELD SAVINGS BANK, ANDREA'S LEGACY FUND, CHAMPLAIN INVESTMENT PARTNERS, LLC, BARI AND PETER DREISSIGACKER, EVERYBODY BELONGS AT THE FLYNN FUND, FORD FOUNDATION, FORREST AND FRANCES LATTNER FOUNDATION, SURDNA FOUNDATION, TD CHARITABLE FOUNDATION, VERMONT ARTS COUNCIL, EVERYBODY BELONGS ARTS INITIATIVE OF BURLINGTON TOWN CENTER/DEVONWOOD, VERMONT COMMUNITY FOUNDATION, NEW ENGLAND FOUNDATION FOR THE ARTS, NATIONAL ENDOWMENT FOR THE ARTS.. ADDITIONAL SUPPORT FROM THE BRUCE J. ANDERSON FOUNDATION & THE WALTER CERF COMMUNITY FUND.

About the Company:

Cahoots NI is at the forefront of Northern Irish theatre and is the leading professional theatre company producing work for children. Since beginning operations in November 2001, Cahoots NI has produced original, boldly innovative work for children, some staged in conventional theatre venues and some in purpose-designed sites or specific locations, including schools and healthcare settings. Its work concentrates on combining the visual potential of theatre with the age-old popularity of magic and illusion.

Prepare to be amazed, dazzled & bewildered by Cahoots NI's mind-blowing production Danny Carmo's Mathematical Mysteries - a spectacular show where Maths, Theatre and Digital Technology collide to create a fun and interactive performance proving that understanding maths can be fun!

Meet Danny Carmo - It's not so long ago that he thought school and, in particular, maths wasn't for him. He was more interested in dreaming about a future on the stage & perhaps the big screen - all he ever wanted to be was a famous magician!!! But when he knuckled down to learn all the tricks of the trade he realised that Math was not only essential... but was the SECRET to a whole load of magic!!!



Before you see the show:

- How do we use math in our lives everyday?
- What does magic mean to you? When we say something is magical, what are we saying really?
- How does math tell a story? In your class, see if you can get creativity and tell a story integrating math concepts.
- When faced with a problem or challenge, what do you do? How do you approach solving the problem? How do logic and creative factor into problem-solving?

As you watch the show:

- How does the company involve the audience during the show? How does this interactive element impact your experience?
- How does the company use humor in the show? What did they do that you found funny or amusing?

After you see the show:

- The company uses magic and theater to help people understand math concepts. What are some other methods people use to understand math?
- What was one of the most intriguing things you learned during the show? What happened that was unexpected?
- How do you think magic tricks are invented? Alone or in small groups, try to create a magic trick using some mathematical element. Share it with classmates.

FUN FACTS ABOUT MATH AND MAGIC

Some Fun and Interesting Math Facts

- The numerical digits we use today such as 1, 2 and 3 are based on the Hindu-Arabic numeral system developed over 1000 years ago.
- 2 and 5 are the only prime numbers that end with a 2 or a 5.
- Here is Pi written to 100 decimal places:
3.1415926535897932384626433832795028
841971693993751
0582097494459230781640628620899862
80348253421170679
- What comes after a million, billion and trillion? A quadrillion, quintillion, sextillion, septillion, octillion, nonillion, decillion and undecillion.
- $11111111 \times 11111111 = 12345678987654321$
- It is believed that Ancient Egyptians used complex mathematics such as algebra, arithmetic and geometry as far back as 3000 BC.
- It wasn't until the 16th century that most mathematical symbols were invented. Before this time math equations were written in words, making it very time consuming.
- Cutting a cake into 8 pieces is possible with just 3 slices, can you work out how?
- An icosagon is a shape with 20 sides.
- The smallest ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29.
- The name of the popular search engine 'Google' came from a misspelling of the word 'googol', which is a very, very large number (the number one followed by one hundred zeros to be exact). A 'googolplex' is the number 1 followed by a googol zeros, this number is so big that it can't be written because there isn't enough room in the universe to fit it in! It would also take a length of time far greater than the age of the universe just to write the numbers.
- The number Pi (the ratio of the circumference to the diameter of a circle) can't be expressed as a fraction, this means it is an irrational number. When written as a decimal it never repeats and never ends

Some Fun and Interesting Magic Facts

- By the 16th century, magicians began to perform as they do today. They did card tricks, made objects disappear, and performed mind reading.
- One of the most famous illusionists was Baron Wolfgang von Kempelen. In 1770 he devised an automated chess player that took on all challengers. Benjamin Franklin played against the machine in 1783 and lost.
- Harry Houdini died on Halloween in 1926, in Detroit, Michigan. The official cause of his death was peritonitis caused by appendicitis. Houdini is still considered the world's best known magician.
- Today, the magic tricks and illusions are done by magicians who perform for huge audiences throughout the world. The tricks and illusions they perform are spectacular. Some make airplanes disappear, levitate cars, and squeeze people into a tiny box. Some of the better known magicians today are: David Copperfield, Siegfried and Roy, Lance Burton, Doug Henning, David Blaine, Penn and Teller, and Derren Brown.
- American Magician, Illusionist and Endurance artist David Blaine has broken several world records and astonished millions of people. He has been encased in ice for 63hours 42minutes and 15seconds, sealed in a transparent case for 44 days, hung upside down for 60 hours and held his breathe for 17minutes 4 1/2 seconds to name a few of his endurance acts.
- David Copperfield is the first living magician to have a star on the famous Hollywood Walk of Fame. The only other magician so honored is Harry Houdini, who received a star after his death.
- The world's fastest magician is Eldon D. Wigton (Dr. Eldoonie). He performed 255 tricks in 2 minutes.



MATH TRICKS & GAMES

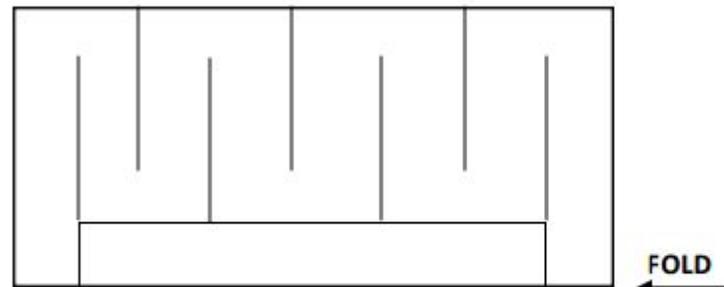
Paper Pass Through

For this “trick” you’ll need a piece of paper and scissors. This activity encourages creative, out of the box thinking and challenging our assumptions.

- Tell the kids that you will pass your body through a piece of paper.
- Pass the paper around and ask your audience to inspect it. Ask for observations about the paper. Is there anything special about the paper or is it just a normal piece of paper?
- Once everyone has looked at the paper, take it back and fold it in half so the short ends meet. Cut a narrow rectangle from the fold. Then cut alternating lines into the paper, start from the folded side. Don’t cut all the way through the paper.
- Unfold the paper. You will have a large loop of paper.
- With great gusto, step through and give a big “tada!”

Ask students to share their responses to the trick. How did it challenge their expectations? How did the paper change to allow you to pass through?

Teach students how to do the trick. If your students are younger, you could create templates using the example below.



Fantastic Five

This trick uses basic mathematical operations to reveal a hidden constant result. Begin by telling students that you can read their minds. Choose a student volunteer.

- Now ask them to think of any number. You may want to warn them it may be easier for them if they choose a smaller or even number. But really, any number will work.
- Now tell them to double the number. Add 10. Divide it in half. Then, subtract the original number.
- Make a show of really thinking hard and trying to read their minds and then say, “Five!” If all the calculations have been done correctly, you’ll have read their minds! (The answer will always be five!)
- Do the trick again with other students and see how quickly they pick up the secret.

Afterwards, have the kids write out the equations they did in their head to see how it works.

Birthday Magic

This trick will allow you to guess the age and birth-month of your student. Ask for a student volunteer, and tell them to concentrate on the number that corresponds to their birthday month, January=1, February=2, etc. (Example, someone with a January birthday who is 10)

- Then tell them to do the following calculations, but keep them hidden from you.
- Multiply that number by 2 ($1 \times 2 = 2$) · Add 5 ($2 + 5 = 7$)
- Multiply by 50 ($7 \times 50 = 350$) · Add their age ($350 + 10 = 360$)
- Subtract 365 ($360 - 365 = -5$)
- Add 115 and tell you the final answer ($-5 + 115 = 110$)
- Once you have that final answer, you can reveal the birthday month: January & age: 10

Secret: The first digit is the birthday month, the remaining digits reveal age.

MATH TRICKS & GAMES



Adding 100 Numbers

Two hundred years ago in Germany, the teacher of an unruly class set his students a task designed to keep them quiet for the rest of the day: Add all the numbers from zero to one hundred. Instantly, one six-year-old came up with the solution. He was Karl Friedrich Gauss who went on to become one of the world's great mathematicians. Here's how to duplicate Gauss's trick and solve a tedious equation with magical speed!

Secret:

Arrange the numbers in fifty pairs, each adding up to

$$101: 1+100=101$$

$$2+ 99=101$$

$$3+ 98=101$$

$$4+ 97=101 \text{ etc.}$$

$$\text{to: } 50+51=101$$

Since you have 50 pairs of numbers which equal 101, simply multiply: $50 \times 101=5,050$

To multiply by 50 with mathemagical speed, first multiply by 100 (add two zeros), then divide by 2.

Hint: To make the trick more mystifying (after all, you could have easily memorized 5,050), invite the audience to give you any starting number and add the 100 numbers from there.

Example: To add the hundred numbers starting 25 and ending with 124

a) Add $25+124=149$

b) Multiply $149 \times 100 = 14,900$

c) Divide $14,900 / 2=7,450$

Mysterious Dice

Defy the laws of probability! Using a simple game die, perform this magical guessing trick for your students. Of the six possible numbers on a game die, you guess the two your student is thinking of.

- Ask for a student volunteer, and tell them to choose any two sides on a die, but keep them secret (Example: 3 & 2)
- Now, ask them to do the following calculations and keep them secret until they have their final answer. (These can absolutely be done on paper or in small groups)
- Multiply one of the numbers by 5. ($3 \times 5 = 15$)
- Add 7 to that product. ($15 + 7 = 22$)
- Double that sum. ($22 \times 2 = 44$)
- Add the other number chosen from die. ($44 + 2 = 46$)
- Ask the student to tell you their final answer. (46)
- Now reveal the original secret numbers. (3 & 2)

Secret:

- Subtract 14 from the final result. ($46-14 = 32$)
- The two digits will be the original numbers. (3 & 2)

The Art Form: Magic

All of the performing arts are self-expression, through different types of art forms. What we do on the outside is a reflection of who we are on the inside, and artists enjoy sharing deeply of themselves, helping us to see the world in a new light, and communicating meaningfully with an audience. Dance, theater, and music are the main umbrella performing arts, but magic is a theatrical art form too. Magicians stand on a stage, present to an audience, and use many elements of theater, like stage presence and storytelling. In magic the elements of theater are in service of an illusion. The illusion or trick is their main interest, and they build a character and an act around their ability to blow our minds with those magnificent and unbelievable feats. Theater and Dance often employ magic and illusion too, in scenic or lighting design, or in special effects, but in theater and dance the illusion is in service to the story, rather than the central act. As you watch the show, observe how the magician makes his magic tricks the central focus of his performance, and weaves story and character around and through them.

WORDS COME ALIVE:

ARTS INTEGRATION ACTIVITIES

PROVIDING THE OPPORTUNITY TO ACTIVELY EXPLORE THE WORLD OF THE SHOW HELPS STUDENTS BECOME MORE ENGAGED AND CONNECTED AUDIENCE MEMBERS, THINKING ABOUT ARTISTS' CHOICES AND APPROACHING THE PERFORMANCE WITH ENHANCED CURIOSITY.

FOR MORE INFORMATION ABOUT OUR ARTS INTEGRATION ACTIVITIES:

- [CLICK HERE](#)
- CALL 652-4548
- EMAIL LAUREN AT SCHOOLPROGRAMS@FLYNNCENTER.ORG



MACHINE: Mathematical Operations

Learning goals: Identify key parts; synthesize.

Performing goals: Invent and repeat non-locomotor movements; create sounds.

Form a circle and ask for demonstrations of repetitive, mechanical movements. Examples: moving an arm from side to side, bending the knees and straightening. Then tell the students that together they are going to make a machine with a variety of parts. Ask for a volunteer to go into the center of the circle and become the first machine part; then ask for another to either make the first machine part bigger by joining the first student in making the exact same movements, or to create a new machine part with her/his own movements. Continue at a fast pace until everyone is part of the machine. Then run the machine by saying "Stop!", then "Start!" Vary the speed as concentration allows.

Repeat this exercise, but this time, split the students into four groups and tell them that they will be creating math machines that mimic math operations. One group will be addition, one subtraction, one multiplication, one division. If you're working with younger students you could exclude the multiplication and division and have two groups each for adding and subtracting. Before creating the machines, have students brainstorm about their operation. This could be done as a whole class to and then groups could be sent to create their machines after the large group brainstorm. In the brainstorm, have students think about some of the following. We'll use division as an example.

- What is happening when you divide?
- What words are similar to division? (Separate, split, break apart, etc.)
- What actions in life involve division? (sorting laundry, cutting a pizza, making muffins, etc.)
- Do you associate any emotions or feelings with division?

Once you've brainstormed as a class or in small groups, give students time to take these ideas and any others that come up for them, and create a machine based on their mathematical operation. Check in with groups as they explore and practice building their machines.

Bring the class together and have each group perform their machine for the other groups. Encourage them to enter one at a time and establish their sound and motion before another group mate enters. After each group performs, ask the audience groups to share their observations. What choices did they see that were interesting? What was the overall feeling of the machine? Allow each group to go and receive feedback.

WE CAN'T WAIT TO SEE YOU AT THE THEATER!

ETIQUETTE FOR LIVE PERFORMANCES: THE ESSENTIALS

- LISTEN, EXPERIENCE, IMAGINE, DISCOVER, LEARN!
- GIVE YOUR ENERGY AND ATTENTION TO THE PERFORMERS.
- PLEASE DO NOT EAT OR DRINK IN THE THEATER.
- TALK ONLY BEFORE AND AFTER THE PERFORMANCE.
- TURN OFF WIRELESS DEVICES.
- NO PHOTOS, VIDEOS, TEXTING, OR LISTENING TO MUSIC.

TEACHERS, A FEW REMINDERS:

- SHARE YOUR EXPERIENCE WITH US! USE THE [FEEDBACK LINKS](#), OR SHARE YOUR STUDENTS' ARTWORK, WRITING, RESPONSES. WE LOVE TO HEAR HOW EXPERIENCES AT THE FLYNN IMPACT OUR AUDIENCES.
- EXPLORE OTHER [STUDENT MATINEES](#) AT THE FLYNN THIS SEASON. WE STILL HAVE SEATS IN SOME SHOWS AND WE'D LOVE TO HELP YOU OR OTHER TEACHERS AT YOUR SCHOOL ENLIVEN LEARNING WITH AN ENGAGING ARTS EXPERIENCE!

THE FLYNN IS A PLACE FOR ALL STUDENTS, AND THESE TOOLS CAN HELP!

PRE OR POST-SHOW VIDEO CHATS:

HELP STUDENTS BUILD ENTHUSIASM OR PROCESS THEIR EXPERIENCE WITH A FREE, 5-10 MINUTE VIDEO CHAT BEFORE OR AFTER THE SHOW! WE CAN SET UP SKYPE/FACETIME/GOOGLE HANGOUTS WITH YOUR CLASS TO ANSWER QUESTIONS ABOUT THE CONTENT, ART FORM, AND EXPERIENCE. CONTACT KAT, [KREDNISS@FLYNNCENTER.ORG](mailto:kredniss@flynncenter.org) TO SET UP YOUR CHAT!



AUTISM AND SENSORY-FRIENDLY ACCOMMODATIONS:

THE FLYNN CENTER HAS BEEN WORKING DILIGENTLY TO BREAK DOWN BARRIERS FOR AUDIENCE MEMBERS WITH DISABILITIES, WITH A PARTICULAR FOCUS ON THOSE WITH SENSORY-SENSITIVITIES. SOCIAL STORIES, BREAK SPACES, SENSORY FRIENDLY MATERIALS, AND MORE ARE AVAILABLE FOR ALL STUDENT MATINEES. FEEL FREE TO LET US KNOW AHEAD OF TIME IF ANY OF THESE WOULD BE USEFUL, OR ASK AN USHER AT THE SHOW!



COMMON CORE STANDARDS

THE COMMON CORE BROADENS THE DEFINITION OF A "TEXT," VIEWING PERFORMANCE AS A FORM OF TEXT, SO YOUR STUDENTS ARE EXPERIENCING AND INTERACTING WITH A TEXT WHEN THEY ATTEND A FLYNN SHOW. SEEING LIVE PERFORMANCE PROVIDES RICH OPPORTUNITIES TO WRITE REFLECTIONS, NARRATIVES, ARGUMENTS, AND MORE. BY WRITING RESPONSES AND/OR USING THE FLYNN STUDY GUIDES, ALL PERFORMANCES CAN BE LINKED TO COMMON CORE:

CC ELA: W 1-10

STUDENT MATINEES SUPPORT THE FOLLOWING NATIONAL CORE ARTS STANDARDS:

CREATING: ANCHOR #1, PERFORMING: ANCHOR #6, RESPONDING: ANCHOR #7, #8, #9, AND CONNECTING: ANCHOR #10 AND #11.

YOU CAN USE THIS PERFORMANCE AND STUDY GUIDE TO ADDRESS THE FOLLOWING COMMON CORE STANDARDS:

CC ELA: RL 1-10, SL 1-4, L 3-5, RST 3,4,7,8

CC MATH: CC, OA, NF, MD, G, SP

WE APPRECIATE AND VALUE YOUR FEEDBACK

- CLICK [HERE](#) TO EVALUATE OUR STUDY GUIDES.
- CLICK [HERE](#) FOR TEACHER FEEDBACK FORMS FOR THE PERFORMANCE.
- CLICK [HERE](#) FOR STUDENT FEEDBACK FORMS FOR THE PERFORMANCE.
- CLICK [HERE](#) FOR PARENT FORMS TO HELP PARENTS ENGAGE WITH THEIR CHILDREN AROUND THE SHOW.

THIS GUIDE WAS WRITTEN & COMPILED BY THE EDUCATION DEPARTMENT AT THE FLYNN CENTER FOR THE PERFORMING ARTS WITH INSPIRATION FROM THE CAHOOTS NI STUDY GUIDE AND WEBSITE. PERMISSION IS GRANTED FOR TEACHERS, PARENTS, AND STUDENTS WHO ARE COMING TO FLYNN SHOWS TO COPY & DISTRIBUTE THIS GUIDE FOR EDUCATIONAL PURPOSES ONLY.