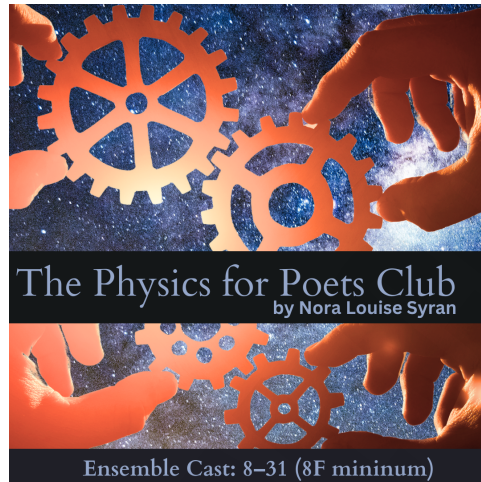


# *The Physics for Poets Club*

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**Synopsis:** Four teenage girls, serving a detention, discover we don't live in a clockwork universe, it's always breaking down. But, as Voltaire's lover Emilie du Châtelet believed, this is the "best of all possible worlds."

The play features the female scientists, mathematicians and intellectuals of the Enlightenment and early Romantic period: Emilie du Châtelet, Mary Somerville, Nicole-Reine Lepaute, Sophie Germain, Mary Anning, Caroline Herschel, Ada Lovelace and Lady Mary Montagu.

Suggested casting for 8 Female Players (31 total roles)

Female 1: (modern teenager) **Enya**

Female 2: (modern teenager) **Iris** - (30-40) **Voltaire**

Female 3: (modern teenager) **Jade** - (20-30) **Joseph Anning**

Female 4: (modern teenager) **Brook** - (30-40) **Monsieur Germain**

Female 5: (30-50s) **Ms. Winthrop**, (30-40s) **Madame de Crequi**,  
(30-40) **Alexis Clairaut**, (40s) **Frau Herschel**, **Oldest Germain  
Sister (Marie-Madeline)**, (30s) **Mary Somerville**

Female 6: (30s-40s) **Madame du Deffand**, (30-50s) **Caroline  
Herschel**, (30-40s) **Madame Germain**, (30s) **Lady Byron**, (30s)  
**Lady Mary Montagu**

Female 7: (20-30s) **Marie de Thil**, (20-40s) **Head Guard**, (25)  
**Nicole-Reine Lepaute\***, (teenager) **Sophie Germain**, **Mary  
Anning**, **Miss Ogilvie**, (40s) **Mr. Nasmyth**, (40s) **Charles Babbage**

Female 8: (20-30s) **Emilie du Chatelet**, (20-30s) **Mademoiselle  
Goulier**, (30-40) **William Herschel**, (teenager) **Youngest  
Germain Sister (Angelique-Ambroise)**, (18) **Ada Bryon Lovelace**

Ensemble Cast List: 8M 23F (31 roles by order of appearance)

**Iris**: Kind-hearted teenager. Sees the good in everyone.

**Jade**: Quirky teenager. Loves bugs.

**Enya**: Bitter teenager. Fiercely intelligent

**Ms. Winthrop**: (30-50s) Wise and crafty Physics Teacher

**Brook**: Artistic teenager. Suffers from narcolepsy.

**Madame du Deffand** (30s-40s) 18th century Salon hostess

**Emilie du Chatelet** (20-30s) Brilliant, charming, vivacious  
mathematician and lover and inspiration to Voltaire

**Marie de Thil** (20-30s) Serious friend to Emilie du Chatelet

**Madame de Crequi** (30-40s) 18th century Gossip

**Head Guard** (20-40s) Fun loving but loyal guard

**Voltaire** (30-40) Philosopher, scientist, du Chatelet's lover

**Nicole-Reine Lepaute\*** (25) Mathematician; loyal, obedient

**Alexis Clairaut** (30-40s) 18th century mathematician

**Mademoiselle Goulier** (20-30s) A petty, jealous woman

**Caroline Herschel** (30-50s) German astronomer in England; obedient, but has her limits

**William Herschel** (30-40) German Astronomer in England; lost as to what to do with his forward thinking sister, Caroline

**Frau Herschel** (40s) Mother to the astronomers William and Carline Herschel; a busy housekeeper with young children

**Sophie Germain** (teenager) Bold young Mathematician

**Angelique-Ambroise Germain:** Youngest sister. Irritating.

**Marie-Madeline Germain:** Oldest sister. A dreamy teenager.

**Madame Germain** (30-40s) Sophie Germain's mother; at a loss as to what to do with her brilliant, unconventional daughter

**Monsieur Germain** (30-40) Sophie's father. Loving but rigid.

**Lady Byron** (30s) Intelligent but deceived by Byron; determined her daughter Ada Lovelace will not become a poet

**Ada Bryon Lovelace** (18) Brilliant daughter of Lord Byron; saw the potential of Babbage's calculation machine

**Mary Somerville** (30s) Mathematician, Teacher

**Joseph Anning** (20-30) Mary Anning's carpenter brother; steady and uncomprehending of Mary's beach combing findings

**Mary Anning** (20-30s) Strong minded beach comber, discoverer

**Charles Babbage** (40s) Inventor of the computer; like many brilliant people, a bit lost in his own mind

**Miss Ogalvie** (20s) Mary Somerville's friend; loves fashion.

**Mr. Nasmyth** (40-50) Art teacher; a bit avant garde

**Lady Mary Montagu** (30s) Poet, letter writer, mother diplomat's wife who helped bring about the end of small pox

\*non speaking

### **Note regarding casting**

While it is preferable to cast the roles of the students with age appropriate actors, as this is a play about women and science, actors can and should be of any race/ethnicity; the stories of these women are meant to inspire us all to "be our own trumpeters."

### **Staging and costumes**

Costumes and set design can be as elaborate or as simple as needed. As Enya points out in the script, "we don't need 100% historical accuracy". The blank palette of a school detention room should lend itself well to being transformed into 18th/19th century drawing rooms, courtyards etc especially if projections are possible and even without, as the use of a few tables, chairs, swords, fans, wigs and some costume pieces will bring the historical scenes to life.

Babbage's machine, however, should be left completely to the imagination. Sound effects are especially encouraged. Note the use of the ticking clock which could be created by the ensemble if necessary.

Suggested backdrops from the **Thorne Miniature Rooms** collection at the Art Institute of Chicago:  
**[www.artic.edu/highlights/12/thorne-miniature-rooms](http://www.artic.edu/highlights/12/thorne-miniature-rooms)**

For more **staging suggestions**:  
<https://www.pinterest.com/SagaScripts/the-physics-for-poets-club/zoom-backgrounds/>

**SCENE ONE - THE PRESENT**

*A high school. A classroom.*

*JADE is on the floor, searching for a bug. She is a down to earth person and marches to her entire own rhythm section.*

*IRIS enters. She is delicate. Tries to see the best in everyone. A people-pleaser.*

IRIS  
Hello.

JADE  
Come here you....

IRIS  
Jade, right? Lizzie's little sister?

JADE  
(disappointed at the connection) Yeah. Hi Iris.

IRIS  
What are you...?

JADE  
Look at this bug.

IRIS  
(surprised)  
Oh.

JADE  
Have you ever seen one like this before?

Jade holds it up for Iris to see.

IRIS  
(disgusted)  
No. Can't say that I have. (pause) Are you collecting them?

JADE  
Yeah. I had my dad install an entire wall of display cases but/

IRIS  
Uh, for bugs? A wall of bugs? Uh... (wondering if she's in the right place) this is detention, right?

JADE

Yeah.

ENYA enters irritated, short-tempered. A deep-thinker with a hard shell not easily cracked.

ENYA

I knew she wouldn't be here on time.

IRIS

Who?

ENYA

Winthrop.

IRIS

I like her.

ENYA

You're not a good judge of character, Iris. You like everybody.

IRIS

Hey, that's not true. I have her for math. She can be a bit strict sometimes, but she's so smart and pretty. I caught a glimpse of her boyfriend. (pause) I bet she's not happy having to spend Saturday with us, instead of with him.

*MS WINTHROP enters.*

MS WINTHROP

Hello Jade, Iris, Enya...and...

Looking behind her as BROOK skulks, half-hidden.

MS WINTHROP

Come on in, Brook.

Brook enters and immediately puts her head on the desktop before her as if she means to fall asleep.

MS WINTHROP

Oh, there will be none of that today, Brook. For any of you. No napping. This is detention. Not an excuse to be lazy/

BROOK

I'm not lazy!

The others are taken aback by  
 Brook's sudden spark of energy. But  
 Brook settles back into her chair.

MS WINTHROP

(laughs it off) Well, you all know why you're here. And lucky me, I've been assigned to keep you here on this fine and sunny Saturday when we could all be outside, off rowing on the lake or picnicking up on the ridge...(dreams of being with before-mentioned boyfriend) But no, we're all here because you young ladies aren't (pause) "applying yourselves" and I'm the lucky one instructed to come up with a suitable punishment. (shuffling through papers) So. Let's see. Iris, failing history, I see. Do you not know that those who fail to learn from history are doomed to repeat it?

IRIS

Yes, Miss Winthrop. I like history, but just not the industrial revolution.

JADE

That's when all the trouble started!

This snaps Brook to attention.

BROOK

Trouble?

JADE

The Industrial Revolution. Capitalism, European imperialism, the Agricultural Revolution and global warming. Climate change. We've been heating up the world ever since!

MS WINTHROP

(scanning documents)

Oh, okay, Jade. Yes, yes...We understand. I'll get to you, in a minute. You have all day to give Iris lessons in history on the Industrial Revolution to help make sure she passes this time. But let's not limit ourselves, shall we? It would seem, Iris, judging from your last report card, you didn't do well on the Age of Enlightenment, either. No. Oh dear. No, not very *enlightened* at all. But English literature; Brava. Good report on the Romantics, I hear. Feminist essay on *Frankenstein*. "The Mothering of Monsters" Well, well...

ENYA

Is the school allowed to give a detention just because someone's failing a class? You'd think you have better things to do on a Saturday/

Cutting off Enya before she makes  
trouble

IRIS

It's alright, Enya. I'm not here just because of history.

MS WINTHROP

I appreciated your enthusiasm, Iris, but the fire alarm was  
tough to explain to Principal Walsh.

BROOK

Fire alarm?

JADE

That was you?!

The others are amazed at this good  
girl having done such a thing.

MS WINTHROP

Iris took her "bring an historical figure in the history of  
mathematics to life" assignment a little too seriously.  
Thespian that she is: full costume, props-- including a  
candle that in her enthusiasm for historical accuracy fell  
over and set some papers on my desk on fire.

Enya laughs.

IRIS

It's not funny, Enya! I was portraying Sophie Germain-- you  
know, the theory of (hesitates)/

MS WINTHROP

(sighs) Elasticity.

IRIS

Elasticity. Her parents didn't allow her to study math, so  
she hid her books under her bedclothes and read them by  
candlelight.

MS WINTHROP

But Sophie Germain didn't set off a fire alarm. (genuine  
kindness) Perhaps a little less drama today, okay?

IRIS

Yes, Miss.

MS WINTHROP

And Jade. (looking at another paper) Well, yes...quite good  
in Biology...and computer science is coming along. Excellent  
in math. Well done. But Literature... Oh, it looks like Iris  
might be able to help you out today. Oh, and, oh...French.  
Oh dear, caught cheating on yesterday's test! Jade. You took  
(MORE)



MS WINTHROP (cont'd)

the time and trouble to tattoo French grammar rules all over your arms but didn't bother to learn them? Honestly, Jade.

ENYA

Do you really need to do this? Rake us over the coals--one by one?

MS WINTHROP

Coals. *Yours* are particularly fiery, Miss Dupont. If I were you, Enya I'd take a deep breath, sit back and think before you speak... and act. You might want to read Iris's essay: *The Mothering of Monsters*. (pause) You and I both know why you're here. And you would do very well to remember Newton's *third* rule of motion: for every action in nature there is an equal and opposite reaction. (noticing Brook asleep) Speaking of reactions. Wake up, Brook. Brook has been sleeping in all of her lessons, notably my class. Mathematics... And if not sleeping, doodling...

Brook rouses herself when she hears her name.

BROOK

It helps me concentrate, Miss.

MS WINTHROP

Well, it would seem you all are perfect examples of Newton's *first* rule of motion: an object will remain at rest or in a uniform state of motion unless that state is changed by an external force. Well, consider today's detention that external force, a little nudge in the right direction, for *all* of you.

MS WINTHROP

You are to write an essay.

They react accordingly.

ENYA

Each of us?

MS WINTHROP

Together.

ENYA

You've got to be kidding.

MS WINTHROP

You and I both know you could write it all on your own and be out of here within the hour, Enya. But no, that would not do. You're all to research it and write it *together*. Learn from each other. Then you may leave. Then we can *all* leave and, just maybe, be in time to watch Venus rise.

With your boy/  
 ENYA

Iris cuts Enya off before she gets herself into further trouble.

IRIS  
 What does the essay have to be about, Miss?

Iris dutifully takes notes.

MS WINTHROP  
 (wryly amused)  
 (Looks at Iris) Since history and math (thinking and looking directly at Enya) physics, (looks at Jade) French and (looks at Brook) a general "spaciness" are the issues here, be sure to weave all of those in/

ENYA  
 Into one essay? Written by all of us?

MS WINTHROP  
 Yes. Call it... "Physics for Poets"

Brook flops her head down onto the table

ENYA  
 We lose an entire day for nothing!

Brook lowers her head and falls asleep, Iris sits at attention and Jade shrugs her shoulders and looks down at the floor for another bug.

MS WINTHROP  
 "Nothing is lost, (pause) nothing is created, everything is transformed..." Isn't that right, Enya? Well, Hopefully it will bring you all some-- enlightenment.

Brook lets out a loud snore.

MS WINTHROP  
 I'll check in on you later this afternoon. Bathroom's down the hall. You have your lunches? (They nod) Good luck!

Ms. Winthrop leaves abruptly.

## **SCENE TWO - THE ORRERY**

After a moment, Iris asks cheerily:

IRIS

So, where do we start?

JADE

We copy and paste some stuff off the internet and we're done.

Brook snores.

IRIS

You don't know Miss Winthrop... We have to actually research ideas and write it ourselves. Brook! wake up!

BROOK

(waking up)

Sorry.

ENYA

What, do you have narcolepsy or something?

BROOK

Yeah. Well, maybe...

Enya laughs out loud,  
unconscionably.

IRIS

It's not funny, Enya!

ENYA

I thought she was kidding.

BROOK

I need another test. They don't know for sure, really. But my mom's ...busy and my dad, well. I shouldn't even be here today.

JADE

It's okay, Brook. You don't need to tell us, unless you want to.

IRIS

Yeah... sorry. You shouldn't have to be here if you're not feeling well.

ENYA

Do we need her? Just let her sleep.

IRIS

Enya, we're supposed to work together, right?

ENYA

Like Winthrop will ever know! Just let her sleep.

IRIS

(positively) What subjects are you good at, Brook?

BROOK

I do okay in Art.

JADE

Do okay!?! You should see her artwork, it's amazing! She made this model of the solar system and the entire thing was made of/

ENYA

Winthrop didn't ask for "art" so that's not going to help.

JADE

Why did you do that?

ENYA

What?

JADE

Cut me off. I was talking.

ENYA

And getting nowhere as usual. Probably about spout some political platitudes or something about global warming again or how we're all going to start eating bugs like sushi so we'd better get used to it.

JADE

(nonplussed)

What's a platitude?

ENYA

Forget it. Let's just write the essay and get out of here.

JADE

What's your problem, Enya? Who made you boss, huh? The project Brook made left the art teacher speechless. It's on display in the front hall. Let's go see it! The Physics for Poets Field Trip! It's in the front hall--Ms Winthrop will never know/

IRIS

No, Jade. Wait? The display cabinet--someone broke in.

BROOK

Broke in?

IRIS

Don't worry. Your project is fine-- the solar system model, right?

BROOK

Yeah.

IRIS

It's fine. Someone stole the astrolabe.

BROOK

What's an astrolabe?

ENYA

A calculator. For astronomy.

IRIS

The one Enya's brother won the physics prize for.

ENYA  
(scoffing)

It only got second place. Newsom didn't like the cardboard/

JADE

Babbage used cardboard for *his* machine.

ENYA

What Machine? Who?

JADE

Babbage. Used cardboard for his test models to make sure it worked. (Wondering why no one knows who she is talking about) The first computer.

IRIS

What were they expecting? That your brother would make it out of brass?

ENYA

It took forever to draw out the charts and get it just perfect. They said it lacked imagination.

BROOK

Astro?/

ENYA

Astrolabe. They said it's just a machine. (demonstrates) Plates turn and you can...it's a calculator.

JADE

You sound like you must be pretty good at physics then, too?

Enya does not answer. The conversation turns uncomfortable. Brook is looking more alert.

JADE

Physics was on the list, right? But if you're good at physics like your brother what are you doing here?/

Quick to change the subject.

ENYA

What did Ms. Winthrop say the essay has to cover?

Iris reads from her notes.

IRIS

History, mathematics, physics, French...

BROOK

and "spaciness"!

IRIS

I've always hated math and science... but I think a lot of it is the teacher/

JADE

Yeah! I blame the teacher all the time. Some of them are so smart. But they just don't know how to explain stuff...like simply. You know. Like down to earth. They're like way up there and we're....well down here.

IRIS

No, no! I think I might just pass math this year because of her. She's encouraging.

ENYA

Winthrop?!

IRIS

Yeah. Me, passing math! My mom would be so proud. She loves science and math and she ended up with me. Her Drama Queen. (laughs) I mean, Miss Winthrop's pretty clear. Most of the time. You're doing well in math, right, Jade?

JADE

Yeah, but I like Biology best.

IRIS

(gently teasing)

Of course you do. Bugs.

Jade returns to her beetle. Brook takes out her computer and stands at it, perhaps behind a lectern or a stack of books on a table.

BROOK  
I'm feeling better, now. I'll type okay?

ENYA  
Standing?

BROOK  
It helps keep me focused.

IRIS  
All right. Good idea.

Brook types but also moves around  
the space from time to time in an  
obvious effort to keep focused.

BROOK  
(typing)  
"Physics for Poets"... It reminds me of the painting I based  
my art project on. Do you know the one where they're all  
standing around a model of the sun and planets and the light  
is hitting them all just, so... It's "Orrery" something...  
I've got it here, hang on...(shows them) "Philosopher  
Lecturing on an Orrery" by Joseph Wright of Derby.

(Optional: projection on stage  
"Philosopher Lecturing on an Orrery"  
by Joseph Wright of Derby or poster  
in the room they are in)

ENYA  
(growing in interest)  
Well, well, well... Art history, huh? You seem to know  
something about it, I'll give you that. But Derby's in  
England, I think. We need something French.

JADE  
What are those men doing?

BROOK  
They're looking at the orrery.

IRIS  
What's an orrery?

BROOK  
A mechanical model of the Solar System. They used it to/

ENYA  
(very interested) ...predict the relative positions and  
motions of the planets and moons. It's a machine...

JADE

Yeah! That's your art project, Brook. Wow! It's...beautiful. A teeny-tiny universe.

ENYA

It's just the solar system. It's not the whole universe. (disappointed sigh) And it's always a group of men. And boys.

IRIS

There were women scientists weren't there? What kind of Enlightenment was it, if not?

BROOK

(Googling)

En-light-en-ment... Wow, there are! I mean, there were! There's (pronouncing carefully) Maria Gaetana Agnesi. According to Wikipedia she was the first female mathematics professor/

ENYA

Sounds Italian.

BROOK

Yes, University of Bologna.

JADE

Bologne, when's the lunch break?

BROOK

Bologna not Bologne!

ENYA

No. We need someone French.

BROOK

But she's perfect...mathematics...1718 -

JADE

How about the German entomologist/

IRIS

(disgusted)

Oh, Jade...(yuck) you and your bugs!

BROOK

What's an etymologist!?

IRIS

Not etymologist. That's a person who studies the origin and history of words. Jade's into insects. (a born teacher) Think: ant. Add an "n": ent-o-mologist. A studier of bugs.



ENYA

You're into words, huh, Drama Queen?

JADE

Yeah, and I'm into bugs! (trying to remember) She went to South America...Maria...something...

ENYA

(irritated)

There are a lot of Maria somethings out there.

BROOK

There's also Laura Bassi. Italian the first female physics professor in the world. 1732

ENYA

Too many teachers. We need scientists. We need to cover history, physics, mathematics/

BROOK

Spaciness!

JADE

And French!

BROOK

(reading intently)

Hey! There's Emilie du Chatelet. This! This is good: Mathematician, philosopher, translator...

ENYA

Who was she?

BROOK

Voltaire's lover.

ENYA

Typical. She does all that and everyone knows her only as Voltaire's lover.

IRIS

Oh yeah, I think I remember hearing about her- they put on plays together or something...

ENYA

She put on plays with Voltaire? Come on! We need a serious French *scientist*, or a *mathematician*.

BROOK

She translated Newton.

IRIS

That sounds serious.

ENYA

Okay...

BROOK

She translated Newton's *Principia* from Latin into French.

JADE

I hate French.

IRIS

How can you hate French? It's a beautiful language. Everyone says so.

ENYA

(playfully)

Especially the French.

BROOK

Listen to this: it says here she introduced Isaac Newton to France, sparking debates across the Channel and then later Mary Somerville translated Laplace into English.

IRIS

Whoa, whoa. Too fast. Newton I know. Sort of. Who is Mary Somerville?

ENYA

Sounds English...

JADE

Laplace? That sounds French!

ENYA

(as if it's common knowledge) Pierre Simon Laplace. Laplace is to the French what Newton is to the English. Laplace proved the solar system is relatively stable and that Mars isn't going to go crashing into the Earth any time soon. Steven Hawking said Laplace essentially predicted the existence of black holes.

The other girls stare at Enya in surprise. Visibly impressed. Enya, uncomfortable with the limelight, shakes it off nonchalantly.

ENYA

It was the age of Enlightenment...Emilie?/

BROOK

Du Chatelet.

ENYA

So Emilie du Chatelet translated Newton's *Principia* from Latin into French and then...?

IRIS

Mary Somerville/

ENYA

Mary Somerville translated Laplace into English. (impressed despite herself) Wow.

IRIS

Sounds complicated. And serious! (taking notes) Chatelet and Somerville. Newton was English, right? (pause) Why write in Latin? And not English?

JADE

That's what scientists did. They wrote in Latin. I know all my insects by their Latin names/

BROOK

Enlightenment. That's why they're staring at the light in the painting. They were questioning everything! But women were questioning too. Right? Emilie du Chatelet. Hang on (mumbling words here and there as she reads) -- King's daughters-- childbirth. (takes a moment to let it sink in) Wow. The amazing thing is that Emilie du Chatelet didn't just translate Newton, she really understood it.

ENYA

(indignant)

Why shouldn't she have?

BROOK

She understood Newton's theories in a time when even the King's own daughters couldn't *write* their own *names*!? She had an education. Her father insisted on it.

JADE

They couldn't write their own names?

ENYA

Girls didn't go to school. (sarcastic) But if they were lucky enough not to marry, then they were sent off to a convent. With hopefully some books around...

IRIS

Wow. That's depressing.

BROOK

Emilie did marry. Had three children. And was pregnant --but not by her husband...or Voltaire--

Enya laughs. They're all a bit shocked and invested in her story.

BROOK

As she worked day and night. Exhausted herself rushing to finish her notes and the translation -- on the day before she died. In childbirth.

They all sigh. Iris looks at her own computer (or Brook's) and is quick to raise everyone's spirits.

IRIS

It says here she liked gambling, diamonds, makeup, singing and science! She's perfect. French and the Enlightenment! And, it says here, Voltaire called her his "Madame Pompon Newton". That's so cute!

JADE

Pom-pons? They make those girls at the assemblies look so/

IRIS

Not cheer-leading pom-pons. Little ball decorations for her dress or hats or something.

JADE

What's her name again?

**SCENE THREE - MADAME POMPON NEWTON**

THE PAST,  
PARIS 1735

18th century salon hosted by Mme du Deffand gossips to Mme de Crequi

MME DU DEFFAND

Emilie du Chatelet! She's here again. I only put up with her for Voltaire's sake. They say *women are never stronger than when they arm themselves with their weaknesses...* but what are her weaknesses? (mockingly) The divine Emilie...

Emilie du Chatelet and her good friend, Marie de Thil, play at cards. They freeze as Iris interrupts the scene.

IRIS

Divine? But that dress...

ENYA

Winthrop said "a little less drama today" right? We don't need 100% historical accuracy, Iris. Okay? Let's get on with it. Do the research and get out of here.

IRIS

But she needs some pom-pons! And feathers!

The others nod their heads in agreement to placate Iris who is obviously not going to budge.

ENYA

Fine. But then lets move on, okay? And focus on the science

IRIS

And the stories!

Enya grudgingly agrees. Iris adjusts Emilie's costume until she's reasonably satisfied and the scene continues.

EMILIE DU CHATELET

Non, non, non! I won that round fair and square.

MARIE DE THIL

Emilie! You counted!

EMILIE DU CHATELET

I did not count the cards, Marie! I promise.

MARIE DE THIL

Good thing I'm not playing you for money, Emilie du Chatelet! Do it, again! What is  $198,456$  divided by  $324$ ?

EMILIE DU CHATELET

Oh, enough parlor tricks, Marie! You know how it puts the ladies on edge.

MARIE DE THIL

Precisely why you must do it! Irritate them! (giggling) Do, Emilie...

EMILIE DU CHATELET

612...and/

MARIE DE THIL

Whoo! More champagne!

Watching the pair play cards the two Madames gossip. Emilie and Marie hear the whole conversation.

Instead of getting angry, Emilie joins in the mockery of herself and stays calm. Amused.

MME DE CRÉQUI

*My cousin, Emilie, for family she is, was a Colossus in every respect. Awkward doesn't even begin to describe her. Her hands and feet were enormous, she was forever tripping over them...*

EMILIE DU CHATELET

(to her friend Marie)

...Which is why my father had me learn to ride a horse and fence. I had so much energy, you see...but yes, I was clumsy.

MME DE CRÉQUI

(unaware of Emilie)

*... and her skin, coarse like a nutmeg-grater. In short, I still find the "divine Emilie" is coarseness personified/*

MARIE DE THIL

Which is why half the men in Paris-- including the Duc de Richelieu --are after you!

MME DE CRÉQUI

*...and as Voltaire has raved of her beauty she feels it necessary to rave on about (mocking) algebra and geometry... They're saying she dresses herself in men's clothing and debates mathematics at the cafe Gradot. And she's taken seriously, too... Imagine!*

MME DU DEFFAND

Her father was far too liberal with her!

MME DE CRÉQUI

He encouraged her to ask questions, debate with him. Imagine! Her father insisted she and her brothers have the same education and left them to wander the library, reading what ever they liked. Really. *She is always pluming herself on her superiority of intellect, whilst, on the contrary, her mind is one hodge-podge of confused ideas.*

Emilie has a harder time refraining from retaliation when her intelligence is questioned.

MARIE DE THIL

(restraining Emilie)

Oh, never you mind her, Emilie. As you said, you want to be a person who thinks. (looking at the gossips) Unlike some women. (pause, teasing as only a friend can) But you *do* like to "plume" yourself! You must admit that!

EMILIE DU CHATELET

Oh, Marie, yes! I do like my pom-pons and my feathers!

MARIE DE THIL

But these chickens think no further than their coop and instead of admiring one another's plumes, they see fit to pluck them out!

EMILIE DU CHATELET

(toasting her friend)

We live in the best of all worlds, Marie...

MARIE DE THIL

You think so? Forever the, what did you call it, optimist?

EMILIE DU CHATELET

I intend to live my best life, Marie. Forge my own happiness.

MARIE DE THIL

What a thought! You're a married woman, Emilie. You've obligations. You've a husband...and children! What are you going to do? Challenge him--the marquis du Châtelet!-- to a duel if he won't let you have your way? Like you did those suitors? Your father must have regretted those fencing and horse riding lessons! Emilie, challenging a suitor to a duel?! Really. Your mother was horrified.

EMILIE DU CHATELET

I did not challenge a suitor. Not directly. I fought the head of the guard. To make a point.

MARIE DE THIL

You certainly did. A sharp one.

EMILIE DU CHATELET

I was tired of all those self-indulgent dandies filing one by one through the chateau gates to ask for my hand in marriage and I thought I'd show them what they were in for.

MARIE DE THIL

You certainly showed them! Stripped yourself down to your petticoat and/

EMILIE DU CHATELET

I nearly beat him!

FURTHER IN THE  
PAST

HEAD GUARD

I'll not fight with you, Mademoiselle de Breteuil...

EMILIE DU CHATELET

But I will fight you and show these suitors just who they are dealing with....en garde.

HEAD GUARD

(while fighting)

Your father is a minister of the court! What...(ding) will he say...(ding) about you here...in your underclothing!

They fight until they're both short of breath. It is a friendly challenge, not a fight to the death.

HEAD GUARD

Do you give up, Mademoiselle?

EMILIE DU CHATELET

Never! You?

HEAD GUARD

Not until you're finished using me to show off...(impressed) You fight like a man (hussar)...

EMILIE DU CHATELET

I'm not showing off...I just want...(ding of sword) to be ...left (ding of sword)...in peace.

HEAD GUARD

(panting)

Peace it is, then. You've shown them what you're made of! We call it a draw? Mademoiselle....?

EMILIE DU CHATELET

(Breathless) A draw.

THE PAST

EMILIE DU CHATELET

Even if my mother had had to sent me off to a convent after that, it was worth it! You should have seen their faces. Wiped those lascivious grins right off!

MARIE DE THIL

All to avoid marrying? But the Marquis du Châtelet!?

EMILIE DU CHATELET

Not avoid, just delay it awhile. I had some reading to do and mother said no proper suitor would choose a bookworm.



MARIE DE THIL

(laughing)

And so without maman's purse you turn to gambling at cards to buy books (snorting with amusement)...Your poor mother. What a scandal. You were... You are. You are wild, Emilie du Chatelet!

EMILIE DU CHATELET

(toasting again)

*Let's choose which path we wish to follow in our lives and strew flowers along our way. Chin, chin.*

EMILIE DU CHATELET

(thinking) I shall go to Cirey. With Voltaire. At least with him I feel I'm a *being with a mind*.

MARIE DE THIL

But your husband's house in Cirey! It's a four day ride from Paris. The middle of nowhere.

EMILIE DU CHATELET

So then you must promise to visit me, and visit me often.

MARIE DE THIL

(half-teasingly)

You'll be sure to return those volumes of geometry before you go...?

EMILIE DU CHATELET

Of course. (Seriously) Geometry is the key to all the doors. I'm certain of it, Marie! I'm tired of Paris. Parties. Shallow laughter of empty headed ladies with no sense. (looking over at the gossips) Look at that one. *Stupid women follow after fashion, the pretentious overdo it--*

MARIE DE THIL & EMILIE DU CHATELET

(well-repeated)

*But women with taste execute it perfectly!*

MARIE DE THIL

As do you with your diamonds and your pom-pons! Oh my dearest, Emilie.

Madame du Deffand and Madame de Crequi turn their attention the arrival of Voltaire, Emilie's new lover.

MME DU DEFFAND

Look there, it's my dear Voltaire at last.

MME DE CRÉQUI

He dares return to Paris...

MME DU DEFFAND

Shhh...no politics! He's here to see Emilie no doubt. I only put up with her so that I might see him from time to time. He still writes me, often....

MME DE CRÉQUI

Uh, they're hardly discreet those too. Honestly. He calls her his:

VOLTAIRE

(bowing in greeting)

"Madame Pomp-on Newton"

MME DE CRÉQUI

Pet names for each other, it's almost sickening.

MME DU DEFFAND

And that a woman should be so interested in science, it's...unnatural. *Women have too much imagination and sensitivity to have much logic.*

VOLTAIRE

(to the audience)

*Son esprit est très philosophe  
Et son cœur aime les pompons.*

Her mind is very philosophical  
And her heart loves pom-pons!

THE PRESENT

ENYA

Gosh, women can be nasty!

JADE

(gleefully)

Oh, don't worry. They probably had their heads lopped off later during the French revolution. Wait (scrolling) Arrested, but oh, darn. No. No "Veuve," no "Widow maker," no "Madame Guillotine" for those two!

IRIS

Jade!

JADE

Iris?

IRIS

Well, you're right. They were pretty awful. (Puts her hand protectively to her throat) But still.

BROOK

(reading)

Emilie du Chatelet's translation and commentary on Newton's *Principia* was not published until years after her death... in 1759.

JADE

When Halley's comet returned.

ENYA

Wow. How do you...?

JADE

And then 1835, 1910, 1986 and/

They're all suitably impressed with Jade's knowledge. Brook who has been reading interrupts Jade to read aloud as she types dramatically for the essay.

BROOK

Everyone suddenly started to look up again as the publication of Newton into French and the arrival of Halley's comet led to a new interest in the mysteries of the universal energy which du Chatelet exemplified in her own life.

IRIS

That's good. Write that down, Brook!

BROOK

(pleased with herself)

I am! I am!

IRIS

Right, Enya?

Iris cannot help but seek Enya's approval. They all wait.

ENYA

Okay (pause) She counts. Emilie du Chatelet. The age of Enlightenment.

JADE

And she's French!

ENYA

Now we're finally getting somewhere.

JADE

There's also Nicole-Reine Lepaute.

ENYA

Do we need another French woman?

JADE

She predicted the return of Halley's comet!

IRIS

How do you know so much about Halley's Comet?

JADE

Cicadas. Life cycles. Google. Rabbit hole, you know. I was looking up the life cycle of a cicada...you know how they keep coming back, like Halley's Comet. Well, these two groups of cicadas haven't come out of the ground together since the Louisiana Purchase and when they do, oh boy/

She remembers the others are not interested in bugs.

JADE

Anyway, Nicole-Reine Lepaute was an astronomer and a human calculator.

ENYA

Wow.

BROOK

I can't imagine doing math without a calculator...

ENYA

I have my father's old slide rule. He was an engineer. He used to give me math problems to solve every Christmas. Instead of chocolates in my advent calendar, I had algebra problems written out on tiny little pieces of paper.

The others are taken aback by Enya's sudden warmth and desire to share. They don't know what to say. There is an awkward silence.

IRIS

I think I would prefer the chocolate.

ENYA

I did too. But now (pause)... I'd give anything for another question. (Changing subject quickly) I don't see where this is going. Science has changed a lot in three hundred years. Human calculators!? We don't live in a clockwork universe. (mockingly) The best of all possible worlds. Even Newton thought God had to step in from time to time to wind it up. It's not a perfect machine that just keeps ticking along; it's always breaking down!

SCENE FOUR - NICOLE-REINE LEPAUTE

THE PAST,  
PARIS 1759

18th century. The sound of clocks ticking. NICOLE-REINE LEPAUTE, ALEXIS CLAIRAUT and his mistress MADEMOISELLE GOULIER join together in a toast to their success.

NICOLE-REINE LEPAUTE, off to the side, blushes slightly with the praise. She never speaks.

ALEXIS CLAIRAUT  
(merrily toasting)

Here's to calculating the return of Halley's comet! And to Madame Lepaute! Our learned calculatrice. We *would not have been able to complete such a colossal enterprise without you.* (Toasting) So, Madame Lepaute, we now return you to your husband and his clocks... (Raising his glass again in a toast) Madame Lepaute: "*Notre sinus des Graces et la tangente de nos cœurs.*"

Mlle Goulier applauds politely as she catches Alexis's attention.

MADMOISELLE GOULIER  
(jealously)

Madame Lepaute, Madame Lepaute... Alexis, mon cherie, I'm am so tired of hearing that woman's name. Promise me, after this evening, we'll have no more talk of Madame Nicole-Reine Lepaute.

ALEXIS CLAIRAUT  
But of course, my dear. Whatever you wish. (playfully)  
Nicole ...who?

THE PRESENT

BROOK  
So when Alexis Clairaut-- this well known and *respected* mathematician-- published the news of their success of the calculation of the return of Halley's comet, he left Nicole's name out. No credit.

IRIS  
That's rotten. We girls have to stick together!

ENYA  
She should have said something!?! Stood up for herself! She didn't say a word!?! Didn't the Enlightenment spark the  
(MORE)

ENYA (cont'd)

American and French revolutions?! Why didn't she say anything? Do something? What was wrong with these women...?

**SCENE FIVE - NO HOUSEKEEPERS!**

BROOK

Okay, calm down. This was three hundred years ago. You said yourself a lot has changed. Let's move on. We know Miss Winthrop is in a rush to see those stars... What a bore! Sitting outside staring at the sky on a Saturday night.

Jade has now taken up the computer  
and is reading with great interest.

JADE

It says here that Caroline Herschel used to sit outside in the cold for so long "sweeping" that her skirts froze to the ground.

ENYA

Sweeping, what was she, a housekeeper? We need scientists!

JADE

No, no... (correcting herself) sweeping the sky with her telescope.

BROOK

When was that?

JADE

1770 or so...

BROOK

Perfect. Caroline Herschel. Smack dab in the middle of the Age of Enlightenment!

JADE

Oh, there's also the German astronomer Maria Kirch-something the first woman to discover a comet.

ENYA

No, no, no. No more comets! No Germans. And no housekeepers!

IRIS

(hopefully)

Mary Somerville was Scottish not English!

ENYA

Scottish? We'll never get out of here!

IRIS

Herschel. But that sounds German too...!

ENYA

Wait, William Herschel? The astronomer?

BROOK

(Googling...clicking)

No, his sister!

ENYA

He had a sister? Of course, it was her brother the famous one...

BROOK

(reading) *Caroline* Herschel: immigrant from Germany.

ENYA

(caustically)

What did the essay need again?

IRIS

History, mathematics, physics, French and "spaciness"

BROOK

Wait! Caroline was English! Originally German. Came over with her brother, William Herschel to take care of his household and assist him in his research/

ENYA

Ah! See! Told you! She was his housekeeper!

**SCENE SIX - CAROLINE HERSCHEL**

THE PAST,  
ENGLAND 1780S

CAROLINE HERSCHEL sits in the cold,  
writing on papers strewn on a small  
table and looking through a  
telescope

CAROLINE HERSCHEL

Last night *I saw an object which I believe will prove tonight to be a comet. I fear it will not be clear to-night though. It has been raining throughout the whole day, but seems now to clear up a little.*

Viewing/note-taking

*One o'clock am - The object of last night is a comet!*

Talking herself through the steps

*Given the true time of the transit - take the transit.*

*What star Mercury is nearest?  
 Note it in the Nautical Almanac.  
 Time of a star's motion to be turned into space...  
 Adjust the quadrant when fastened to the telescope.  
 A logarithm given...  
 Find the angle...*

Her brother, WILLIAM HERSCHEL, bows  
 low to (an unseen) King George III.

WILLIAM HERSCHEL

I'll be sure, your Majesty, to communicate your praise to my sister-- my *indefatigable assistant*. (Listening in agreement) Ah, yes it's a story very much like *Aschenputtel*... (realizing he's speaking German) My apologies, *Cinderella*, your majesty. It is a story very much like *Cinderella*. You see, my sister, Caroline, was sickly as a child. That's why she's such a tiny thing. But under my tutelage, she has become a sensation: a renowned singer and now my paid assistant at 50 pounds a year, thanks to you, your majesty. Who could have imagined it; she spoke no English, no French upon her arrival in England, was far from social, forever at my side like an obedient spaniel, but still...who would have thought. Certainly not my mother...

William reads a letter from his  
 mother/She recites it while  
 ironing/folding linens etc.

FRAU HERSCHEL

My dear William, Caroline will never marry, not with her stature. She's a tolerable house maid however; works quickly and without too much grumbling. I'll be loathe to part with her. But as you wish me to send her to Bath to run your household, by all means; you must return to Germany then at once to accompany her back to England with you. She'll be of better use to you there in England than here in Germany without the prospect of a husband. Return soon to Germany to see (signing off) Your Dear Mother

THE PRESENT/  
 PAST

ENYA

That sounds like my mother; she buys me fashion magazines and hopes I'll study them like I do physics. Did she marry?

JADE

Caroline Herschel never married, but she went on to discover eight comets with a handmade telescope!

IRIS

You and those comets!



WILLIAM HERSCHEL

You see, your majesty. Caroline is far from tiny in spirit. We've swept the sky and mapped the heavens. I wouldn't have discovered George without her.

JADE

George?

IRIS

Uranus.

JADE

He discovered Uranus!?

BROOK

(snapping awake)

Excuse me...?!

Iris is now reading from the computer, fully engrossed.

IRIS

William Herschel, Caroline's brother, discovered the first new planet--the first discovered in a thousand years! But he named it after King George: Georgium Sidus. The Star-Planet of George.

JADE

(Laughs)

I prefer Uranus.

IRIS

They did too...the name changed, nearly a hundred years later.

JADE

Much to the delight of school children everywhere, ever since!

They all laugh at this news.

ENYA

I don't know why we're giving so much attention to William Herschel. Sure, he may have discovered Uranus, but he also thought that the moon was inhabited.

The others stop to look at her.

ENYA

I'm not joking. Google it! He honestly believed the moon was inhabited by ... Lunarians.

They all laugh again and their laughter joins Caroline as she warms up her voice, getting ready to sing.

THE PAST

CAROLINE HERSCHEL is singing scales. Warming up her singing voice. WILLIAM HERSCHEL is adjusting his telescope in a hurry.

CAROLINE HERSCHEL

(vocalizing)

Me, me, me me, me, me, me, me....

WILLIAM HERSCHEL

Caroline! Hurry I need that mirror!

CAROLINE HERSCHEL

Do, re, me fa, so, la...

WILLIAM HERSCHEL

Caroline! Quickly! The mirror. Come see...it's, it's beautiful!

She spoon-feeds him porridge from a bowl as he looks through the now well assembled telescope which he keeps trying to adjust.

CAROLINE HERSCHEL

William. You must eat. Here. Listen William. Are you listening?

WILLIAM HERSCHEL

Hmmm....

CAROLINE HERSCHEL

You brought me from Germany to manage your household.  
 (pause) I've done this. Then you ask me to learn to sing.  
 (pause) I have learned. And now that I'm finally starting to make a name for myself as a musician here in Bath, you ask me to drop it all and assist you to map the night sky!? You're obsessed and not eating...unless I feed you! It's ridiculous. I'm like a well-trained puppy-dog.

William turns occasionally to her and away from the telescope which absorbs his attention. He's been half-listening.

WILLIAM HERSCHEL

You need to get out, Caroline, into town. You need some distraction. If only you spent more time with Miss, what's her name?

CAROLINE HERSCHEL

Miss What's-Her-Name told me off for *being my own Trumpeter!*

WILLIAM HERSCHEL

(carefully)

I believe it's proper for a young lady in England to show some modesty, Caroline. It was probably not the best --for the sake of astronomy --to reply to her by saying:

CAROLINE HERSCHEL

*How can I help but be my own trumpeter? I cannot afford to keep one! (amused and then frustrated) Oh, dear brother, I think most of those society ladies little better than idiots. You forget, dear William, I grew up listening to your debates with father and the others late into the night.*

A comforting sound of the ticking  
of a clock. Warm, steady.

*It made me so happy to hear you all so happy... Sometimes you'd argue with such warmth, when the names Leibnitz, Newton, and Euler sounded/*

*Frau Herschel joins them and the warmth is shattered. She is exhausted, in her arms a basket of linen.*

FRAU HERSCHEL

*Too loud! How do you expect the little ones to sleep with all this philosophical talk?! So late! So loud! To bed, all of you. The little ones ought to be in school by seven in the morning.*

Grumbling, wiping her forehead,  
turning to Caroline.

FRAU HERSCHEL

Your father wishes to give you more of an education. To what purpose I ask? You read, you write, you knit socks. It's enough.

She is constantly working, folding  
linen etc. Caroline helps her.

CAROLINE HERSCHEL

*So all my father could do for me was to indulge me and please himself. Sometimes with a short lesson on the violin, when my mother was either in good humor or out of the way. You see, she missed you terribly when you left for England, William... and I cannot not help but think that she had cause for wishing me not to know more than was necessary. Just enough education to be of use in the family with the chores; yes, like Cinderella. For it was her certain belief that:*

FRAU HERSCHEL

William, would have returned to Germany -- to his home here, to me. William would not have looked so high, traveled so far from home-- if he had had just a little less learning.

**SCENE SEVEN - SOPHIE GERMAIN**

JADE

They started school at seven in the morning...?

ENYA

So, okay, thanks to her brother, Caroline Herschel became the first paid female astronomer. That's (pause) not bad.

IRIS

And she and Mary Somerville were both made the first female members of the Royal Astronomical Society in 1835. Mary Somerville!

ENYA

1835?! We need to stay in chronological order, you're failing history remember!? Jumping around is not going to help you pass.

BROOK

(reading)

Listen to this: 1789. Thirteen year old Marie Sophie Germain/

IRIS

Sophie Germain!?

ENYA

Fire alarm, Sophie Germain?

BROOK

Yes (reading) fire alarm Sophie German. Okay, 1789. So (looking) toward the end of the Enlightenment/

ENYA

(laughs) Yeah! When the French started lopping off people's heads/

BROOK

(ignoring her)

Because of the French revolution raging outside their home on Rue Saint Denis in Paris, thirteen year old Sophie Germain was forced to stay indoors where she spent her time reading...

The action turns to revolutionary France. A private home in Paris. Sophie Germain sits reading in a library, completely engrossed in a book (The History of Mathematics) as if reading a juicy novel.

SOPHIE GERMAIN

(with great interest)

He did not look up when the soldier entered his chamber, so immersed was he in his study of infinitesimals that he did not hear the soldier's order to stand. The roman soldier shouted his orders again, but Archimedes, the genius of antiquity, was so immersed in his study to calculate areas and volumes that he did not even notice the soldier draw his sword and/

Sophie's sisters interrupt her reverie.

ANGÉLIQUE-AMBROISE (YOUNGER SISTER)

Maman, Sophie's reading that history of mathematics book again!

SOPHIE GERMAIN

Shhh...(she goes back to her reading)

ANGÉLIQUE-AMBROISE (YOUNGER SISTER)

Here's one for you, Sophie. Even you'll enjoy it, Madeline. (reading aloud quite dramatically) "Sir Isaac Newton Explain'd for the Ladies" by Francesco Algarotti. (Grandly) And I quote the Marquise's explanation of the inverse square law of gravitational attraction-- whatever that is!!--

SOPHIE GERMAIN

(grabbing the book)

"...After eight days of absence, love becomes sixty-four times less amorous than it was the first day" (tosses the book back) What utter nonsense.

ANGÉLIQUE-AMBROISE (YOUNGER SISTER)

Well, it certainly explains Madeline's sighs for "Charlie" lately!

MARIE-MADELINE (OLDER SISTER)

Ha, ha, ha...

SOPHIE GERMAIN

No thank you...I'll carry on learning Latin, thank you.

Their mother enters, frazzled by the revolution outside and the chaos of young girls inside.

MADAME GERMAIN

Girls, girls, girls...this library is a mess! Sophie your precious books...Marie-Madeline, what is all this....?

MARIE-MADELINE (OLDER SISTER)

Playbills... Look this one's from *Les Femmes Savantes*...do you remember? With Larive playing the lover Clitandre! Wasn't he just divine...Oh, I do so love Moliere...How I miss the theater! Maman, when will we be able to go out again? Just to the cafe on the corner...?! How I miss society!

MADAME GERMAIN

You know it's far too dangerous to go out. They've stormed the Bastille. Have patience, my dears!

ANGÉLIQUE-AMBROISE (YOUNGER SISTER)

(teasing)

Madeline just wants an excuse to see Charles...

MARIE-MADELINE

Stop it, Angélique! I just want to live my life...but no, we're trapped here doing nothing day after day after day. I want to go out! I want to go to shopping, to the theater...

ANGÉLIQUE-AMBROISE (YOUNGER SISTER)

But we've our own little "learned lady", our Sophie, our little femme savante right here, don't we!? (takes Sophie's book from her)

SOPHIE GERMAIN

Hey! Give that back.

MADAME GERMAIN

To bed girls. And no more reading, Sophie! No candles under the bedclothes; you'll burn the house down!

SOPHIE GERMAIN

Oui, maman...

The girls head off to bed. When all is quiet, Madame Germain and Monsieur Germain enter again in darkness, observing Sophie by candlelight. Whispering.

MADAME GERMAIN

She's fallen asleep again at her writing desk. It's so cold in here the ink has frozen in the well. What shall we do?

MONSIEUR GERMAIN

You're certain no servant lights her fire? Where is she getting her candle stubs? And those extra books?

MADAME GERMAIN

She's determined to study mathematics. Heaven knows why, it must be your side of the family... (hopefully) Perhaps we should relent?

BROOK

Once, after she'd spent the years of the Terror studying differential calculus, she was immortalized in a poem:

Sophie's Mother stands reading a letter, a bit unsure what to make of her brilliant daughter.

MADAME GERMAIN

(half proud, half horrified)

*"Gods stop her flight:  
While you can, rein in this Icarian girl;  
For her burning efforts will conquer giants.  
This ambitious woman already wanders in LaPlace's realm!"*

BROOK

Laplace again!

ENYA

Shh!

MADAME GERMAIN

*This ambitious woman already wanders in LaPlace's realm! And drinks the airy fires with greedy gulps! (scanning it silently for a moment) Ambitious woman. Oh dear, Sophie. I preferred it when Monsieur Lagrange and all those others thought you were a gentleman. Mathematician Monsieur Le Blanc. This has gone too far! What will your father say? What will people think...? (looking through the mail) And another letter from Germany... (proudly) From Monsieur Gauss? Oh, I don't know what to think... You go ahead and read your letter, dear.*

She leaves her daughter to read.

SOPHIE GERMAIN

(reading a letter)

*"But how can I describe my astonishment and admiration on seeing my esteemed correspondent Monsieur Le Blanc metamorphosed into this celebrated person, yielding work so brilliant it is hard to believe? A taste for ...the mysteries of numbers is excessively rare... But when a woman, because of her sex--encounters infinitely more obstacles than men--yet overcomes these obstacles, then without doubt she must have the noblest courage, extraordinary talents and a superior genius."*

She hugs the letter to herself.  
Thank you, Monsieur Gauss.

THE PRESENT

IRIS

(emphatically)

That's just like Mary Somerville. Her parents thought that too much study would make her go insane!

JADE

What's insane is that the Eiffel Tower only stands because of Sophie Germain's work on elasticity but her name is not engraved on it like the other scientists and mathematicians of her day!

ENYA

What a privilege men have/

SOPHIE GERMAIN

*Ah, the privilege of the ladies: they get compliments [but] no real benefits. It matters little who first arrives at an idea, rather what is significant is how far that idea can go...*

ENYA

Of course it matters who first arrives at an idea--ugh!  
Who's next!?

### **SCENE EIGHT - THE ROMANTICS**

IRIS

Mary Somerville/

JADE

Mesopotamia: Enheduanna. High Priestess of the Moon goddess.



ENYA

No. Too weird.

Iris grows increasingly irritated  
at Somerville being rejected.

BROOK

Hypatia...Ancient Greece. Mathematician with her father...  
died at the hands of an angry Christian mob.

ENYA

No, no, no... Too far in the past. Winthrop said the age of  
Enlightenment, right? When was that exactly...

BROOK

So...(checking) 1700s-ish to early 1800s. 1815 or so...

ENYA

Or so?

JADE

It's not like someone woke up New Year's Day 1816 stretched  
and said, ah, it's over now, the Romantic Age has begun!

IRIS

Oh, the Romantics. I love them. Beethoven, Mary Shelley... I  
may not be any good at math, but I adore poetry!

BROOK

(searching)

The Romantics: female scientists. Ah...Ada Lovelace 1815-  
1852

JADE

My computer science teacher loves her. She the first to have  
really imagined what computers could be capable of.

IRIS

(emphatically)

And *her* tutor was Mary Somerville! I'm telling you, we  
should focus on/

ENYA

Her tutor? A teacher?!

BROOK

(clicking excitedly)

Ada's father was the poet, Lord Byron!

ENYA

It always comes back to the father, (pause) the brother...

SCENE NINE - MEETING MISS BYRON

THE PAST,  
ENGLAND 1820S

Lady Byron and Mary Somerville  
drink tea while her daughter Ada is  
busy flapping her arms like wings.

LADY BYRON

My dear Mrs. Somerville, I should warn you before you accept to take Ada as your pupil that she has led a rather isolated childhood. She never saw her father, Lord Byron, after our...separation...

Ada's play interrupts their  
discussion.

ADA BYRON (LOVELACE)

One, two, three, four...

Ada is flapping her arms up and  
down.

MARY SOMERVILLE

What is she doing?

LADY BYRON

Ada is studying what she calls "flyology". She's imagining and designing a machine to mimic bird flight.

ADA BYRON (LOVELACE)

(seriously)

*I have got a scheme to make a thing in the form of a horse with a steam engine in the inside so contrived as to move an immense pair of wings, fixed on the outside of the horse, in such a manner as to carry it up into the air while a person sits on its back!*

MARY SOMERVILLE

(impressed)

Well...

LADY BYRON

You see how she is inclined. She's inherited enough nonsense from her father. (with bitterness) Lord Byron. I do not permit Ada to study poetry, Miss Somerville. She is, though, quite proficient in music. I intend to stamp out her father's influence. Did you know he kept a tame bear in his college rooms in Cambridge? Ridiculous... She's exhibiting far too much imagination already.

MARY SOMERVILLE

In my experience, imagination paired with mathematics and the sciences can only be a *good* thing... But I assure you Lady Byron *while my head is up among the stars, my feet are firm upon the earth.*

LADY BYRON

Surely *your* parents never allowed the study of "insane poetry" in your education?

MARY SOMERVILLE

It was another generation, Lady Byron. I recall my father once saying to my mother about my habit of reading late into the night, (gruffly, imitating her father) "Peg, we must put a stop to this reading nonsense or we shall have Mary in a straitjacket one of these days."

LADY BYRON

Quite a different world indeed. But it's *because* I wish to keep Ada out of a straitjacket that should you take her on as your pupil, I will not approve of idleness, nonsense or poetry.

ADA BYRON (LOVELACE)

*I do not believe that my father was such a great poet as I shall be an Analyst & Metaphysician one day...*

She is distracted by a cat's meow.  
She is suddenly just a child again.

ADA BYRON (LOVELACE)

Mrs. Puff!? Here kitty, kitty...

THE PRESENT

**SCENE TEN - MARY SOMERVILLE**

ENYA

The Romantics!? No, no, no it's too late. Winthrop said the Age of Enlightenment and I think we should stick to that, no? Or we will be here all day. And we've already got enough: Emilie du Chatelet, Nicole Reine-Lapaute, Caroline Herschel and Sophie Germain. Ada Lovelace? No. Her father was the Romantic poet, Lord Byron! We need to start writing!

IRIS

(ignoring Enya)

Mary Somerville ran wild until she was nine when her Admiral father, Sir William Fairfax, returned home to find she could hardly read!

Burntisland, County of Fife,  
Scotland. MARY SOMERVILLE stands on  
a seashore, a grown woman, full of  
nostalgia. Sound of waves lapping.

MARY SOMERVILLE

When my father returned from sea, he was shocked to find me such a savage. I was like a wild animal escaped out of a cage. (pause) It seemed to me that half the world was terra incognita. When the tide was out I spent hours on the sands, looking at the star-fish and sea-urchins...I made collections of shells, some were so small that they appeared like white specks in the black sand...like stars in the night sky above. I was astonished to see the surface of stones covered with beautiful impressions of what seemed to be leaves; how they got there I could not imagine, but I collected these objects of curiosity and amusement to me in my lonely life.

JADE

Fossils! She combed the beaches as a child just like...  
(searching) uh... I found it: Mary Anning-- fossil hunter.

**SCENE ELEVEN - MARY ANNING**

PAST/PRESENT

Sound of the waves rushing the  
shore. Wind, seagulls. Lyme Regis,  
Dorset, England. JOSEPH ANNING and  
MARY ANNING are digging.

JOSEPH ANNING

(thick Dorset dialect)

Here right, Mary! That's where I found it: the crocodile head.

MARY ANNING

(thick Dorset dialect)

No, not a crocodile, I think... Joseph. The rest of it must be buried deep.

JOSEPH ANNING

Let's dig! I'll get the shovels...

MARY ANNING

No. Look there, a storm is coming. It'll do the work for us.

PRESENT/AHEAD  
IN THE PAST

JADE

(reading)

They carried on combing the shore for "curiosities" to sell to support Mary's widowed mother and a whole year passed before Mary discovered the rest of the/

MARY ANNING

(reading a broadside)

They're calling it an Ichthyosaur.

JOSEPH ANNING

Do they make mention o's, Mary?

MARY ANNING

No...we're only "the fossil hunters of Lyme Regis"...

JADE

And she went on over the years to find many many more... ichthyosaurs, plesiosaurs...painstakingly cleaning and preparing them to sell to collectors who then sold them on to the British Museum without crediting her for the work.

(sarcastically)

Poor, local country girl...what could she *possibly* understand about what she was digging up!?

THE PAST,  
DORSET 1835

Sounds of the seashore, waves,  
seagulls. Tapping of a hammer.

JOSEPH ANNING

(digging, reciting  
happily to himself)

SHE SELLS SEA SHELLS ON THE SEASHORE  
SNAKES STONES AND VERTEBERRIES ON THE SEAFLOOR

MARY ANNING

Stop with that, will you...

JOSEPH ANNING

They're all saying it. About you, Mary. You're world famous now...for your seashells.

MARY ANNING

They're not seashells, Joseph. After all these years, don't you understand the importance of what we're doing?

JOSEPH ANNING

I know it's flummoxed the Church of England zummat awful. Who would 'ave thought the world older than a few thousand years...(hushed voice) or the Bible could be wrong. I'm just  
(MORE)

JOSEPH ANNING (cont'd)  
 a digger, Mary...Don't know much about nothing. But I fancy I know more now about upholstery than you do. (laughing)

MARY ANNING  
 And you're set to make more of a living out of it than I ever will, collecting "sea shells".

JOSEPH ANNING  
 (seriously, proudly)  
 You, Mary Anning, you are a geologist.

MARY ANNING  
 Tell that to the Geological Society of London.

JOSEPH ANNING  
 Never you mind them. You're a geologist and whatever else you call someone who dissects animals on the kitchen table late into the night...(lightheartedly) Look at those hands of yours...'tis no wonder you're not married.

MARY ANNING  
 (mockingly)  
 Who would marry a girl with so much dirt under her fingernails!?

JOSEPH ANNING  
 But you're world famous now, Mary! You said so yerself to the King of Saxony when he came to visit your shop:

MARY ANNING  
 (curtsying)  
 I am well known throughout the whole of Europe...

They both laugh...

MARY ANNING  
 (suddenly serious)  
 It's no laughing matter, though, Joseph. *The world has used me so unkindly, I fear it has made me suspicious of everyone.*

JOSEPH ANNING  
 Annan? You think those ramshacklum London chaps care about any working class woman--or man, I might add-- in Dorset, or the whole of England? You done dug up some banging girt fossils, Mary and should be proud yerself.

MARY ANNING  
 Mr. Hawkins added bones to the ichthyosaur fossil I helped him find! He's *such an enthusiast that he makes things as he imagines they ought to be and not as they are really found* in the ground! ...and he claims to be a man of science?!

JOSEPH ANNING

But Henry de la Beche, Mr. Buckland...many have praised you, publicly, Mary.

MARY ANNING

In the beginning, Joseph, I could have almost considered myself their equal. But the further we dig down into the layers of rock, into the mysteries of time itself, the more secrets are closed off from me no matter how deep I dig. While we used to discuss and debate together, here on the shore, out in the open, now the conversations take place behind closed doors, in the cities, in the universities. Formal discussions in lecture halls that are closed to me, Joseph. (pause, looking) A storm's coming.

JOSEPH ANNING

Mother's right, Mary. You are *a history and a mystery*. Whoever would have thought you could survive that lightning strike and turn out stronger than before? They say it were a miracle, you know Mary you survived it and have become the spry stubborn woman you are today.

MARY ANNING

I don't believe in miracles, Joseph. I believe in what I see and feel. Keep digging. We're nearly there, careful.

Sounds of the sea fade out.

THE PRESENT

JADE

By the time Halley's comet returned in 1835, Mary was world famous!

BROOK

But still miserably poor, combing the beaches of Lyme Regis for fossils to sell.

JADE

Fossils which inspired Charles Darwin who landed that very same year in the Galapagos to observe the birds and ponder the Origin of the Species.

ENYA

Fossils? We're going all over the place! We're not including Mary Anning or we're going to be here all day!

JADE

(ignoring Enya)

She brings a nice balance between earth and the sky...

BROOK

(typing)

That's good, I'll write that down..."nice balance..."

IRIS

(indignantly)

Why can't we include Mary Somerville if we include Mary Anning?

ENYA

(bitterly sarcastic)

Let's just include *all* the Romantics! And *all* the Marys-- Mary Somerville, Mary Anning. We can even throw Mary Shelley in there too! Hey, she wrote a novel about a scientist! That counts! Oh and sure, let's include Ada Lovelace because Mary Shelley knew her father Lord Byron and, oh, oh, while we're at it, Ada's best friend Florence Nightingale, after all she was a nurse and she had her statistics... We'll never finish this essay!

They stand awkwardly in silence at this impassioned outburst.

**SCENE TWELVE - MEETING MR. BABBAGE**

BROOK

Wait? But I thought we said okay for Ada Lovelace...!?

IRIS

(calmly)

Mary Somerville is the one who introduced Ada Lovelace to Charles Babbage and his Difference Engine.

ENYA

(calming down)

Engine? What engine?

JADE

A calculating machine. The first computer.

BROOK

(reading)

Mary Somerville introduced Ada Lovelace to Charles Babbage on the occasion of her ...coming out?

JADE

Coming out? What, like of the closet?

IRIS

No, back then young women, debutantes, would make a big appearance in public to announce they were ready to be married off.



ENYA

Great. Okay, okay. Let's get to the machine.

PRESENT/PAST

LADY BYRON

Mrs. Somerville, would you be so kind as to introduce Ada and myself to Mr. Charles Babbage? Talk of his machine is buzzing all over London.

ADA BYRON (LOVELACE)

(privately) Mama says he's rather a difficult character and to not be put off by him.

LADY BYRON

Beneath his gruff appearance, he really is a gentleman and a great man of science.

MARY SOMERVILLE

Mr. Babbage, may I present Miss Ada Byron.

JADE

Ew. He's like 40...

IRIS

She's not going to marry him. Shh!

JADE

Oh, phew!

ADA BYRON (LOVELACE)

Enchantée, Mr. Babbage.

MARY SOMERVILLE

You'll recall, Miss Byron, the lecture on geography I took you and my daughters to three years ago? Well it was due to Mr. Babbage's intervention that the University of London opened its doors to us. Women.

CHARLES BABBAGE

And then subsequently closed them again the year after. I am sorry.

ADA BYRON (LOVELACE)

Mrs. Somerville was just recounting an amusing anecdote about how she first discovered her love of mathematics. In, of all things, a ladies magazine.

MARY SOMERVILLE

Yes, when I was young, I was often invited with my mother to tea-parties given either by widows or maiden ladies who resided at Burntisland.

Tea party. Clinking of teaspoons,  
chatter. Laughter. Clock ticking.

MARY SOMERVILLE

They bored me exceedingly, but in 1795, when I was fifteen,  
I there became acquainted with a Miss Ogilvie, much younger  
than the rest...

Miss Ogilvie shows Mary a monthly  
magazine with coloured plates of  
ladies' dresses, charades, and  
puzzles.

MISS OGILVIE

Oh and look here, Mary. They're raising waistlines again and  
look, the skirts will be even slimmer this summer. Oh, I've  
just the right parasol, but I just cannot be without a  
bonnet. I don't know how some women can be so bold as to go  
without one...and that hairstyle, what are they calling  
them, Psyche knots?

MARY SOMERVILLE

What's this? These strange looking lines and letters, these  
Xs and Ys? I can't make it out. Is it a new puzzle?

MISS OGILVIE

Oh, it is a kind of arithmetic: they call it algebra; but I  
can tell you nothing about it. (back to her magazine) Oh  
look at this...

They move into a landscape painting  
class for ladies led by MR. NASMYTH

MARY SOMERVILLE

(to the audience)

*Unfortunately not one of our acquaintances or relations knew  
anything of algebra or science and I had no courage to ask  
any of them for fear of being laughed at. Meanwhile, my  
mother, allowed me to attend a landscape painting class. Mr.  
Nasmyth, besides being a good artist, was clever and well-  
informed.*

Nasmyth hands Somerville a book:  
Elements of Geometry

MR. NASMYTH (PAINTER)

*You should study Euclid's Elements of Geometry; the  
foundation not only of perspective, but of astronomy and all  
mechanical science.*

MARY SOMERVILLE

*And so I did.*

The scene returns to Ada's Coming  
Out Party.

CHARLES BABBAGE

Thankfully for us all. Imagine, learning of algebra at a tea party and geometry in a painting class?! Well, Mrs Somerville, your explanations and diagrams, let alone your marvelous translation of the *Mechanism of the Heavens*, make it more comprehensible even than Laplace's original work itself.

MARY SOMERVILLE

(with humility)

*I simply re-imagined Laplace's work in algebra into common language.*

CHARLES BABBAGE

It is pure genius. Your studies in mathematics, geography and astronomy have pulled everything together. You've seen and articulated connections that have not been considered before. Like cogs in a wheel, fitting together into a giant puzzle. Very much like my machine which I'm delighted to show you, Madame... What is it they are calling you?

ADA BYRON (LOVELACE)

A scientist.

CHARLES BABBAGE

Yes, that works quite well. Madame Scientist.

MARY SOMERVILLE

Thank you, Mr. Babbage. But you and I agree, I think, that my fellow Scot, Mr. Carlyle is greatly mistaken. History is not made up only of a series of great men making great discoveries. Great discoveries come about due to the the slow progress of many.

CHARLES BABBAGE

Including women, my dear Mrs. Somerville. Including women.

THE PRESENT

### **SCENE THIRTEEN - THE ASTROLABE**

ENYA

(angrily)

What about the machine? You said she introduced Ada Lovelace to Mr. Babbage and his machine!

IRIS

I thought you said we had to cut Mary and Ada because they were Romantics...?!

ENYA

I just want to hear about the machine. Get to the machine.

IRIS

What is up with you, Enya? (pause)

ENYA

What did it look like? How did it work? Did it run on steam? What else did he build? Was Ada Lovelace like a programmer or something? Why have I not learned about this?

IRIS

Why are you here today, anyway? (pause) Jade cheated in French, I'm failing history and... I set off the fire alarm --by accident!-- Brook is trying to keep herself awake, poor thing, but why are you here, Enya? You can't be failing Physics. (pause) Does it have something to do with the astrolabe?

BROOK

Her brother's physics project?

IRIS

I heard it was found. Ripped in little pieces.

Enya is silent. They look at each other and suddenly realize why Enya has been punished.

IRIS

You took it. Ripped it up. Didn't you? (pause) Why...?

ENYA

Physics is the only subject my brother's passing. He's not interested in much else these days. Not after dad died.

IRIS

Why rip up your brother's physics project?

ENYA

I'm sick of hiding what I can do just so my brother can feel better about himself. My mother won't let me take Honors Physics so I won't compete with him and (mockingly) shatter his self-esteem knowing that his sister gets better grades than he does! (sighs) My dad encouraged me in math and science but my mom...my brother... (She sighs)

IRIS

Your father died in that bridge accident, didn't he?

ENYA

A bridge he designed. Too many people moving in the same direction. It start to sway and sway and... People just  
(MORE)

ENYA (cont'd)  
 stood their watching on the other side. Getting in the way  
 of the ambulances and/

They know the bridge she is talking  
 about but are shocked at this news.

ENYA  
 (pleading)  
 Can we just keep going? Please. I just want to hear about  
 the machine. How it worked! I need to know how it works!

IRIS  
 Okay. (calmly and softly) But why can't we include Mary  
 Somerville?

ENYA  
 (sharply)  
 We should *cut* all of the Romantics!

IRIS  
 But why?

ENYA  
 (snapping)  
 Because they failed, that's why. We've spent all afternoon  
 talking about a few women who didn't originate anything new.  
 Who are nothing more than footnotes in history. And this was  
 supposed to bring us some sort of enlightenment?

IRIS  
 Somerville predicted the existence of Neptune/

ENYA  
 Predicted Neptune, didn't discover it!

IRIS  
 Somerville might not have invented or discovered anything  
 new but she was revolutionary! She saw how all the sciences  
 come together! It was for her the word scientist was coined!

BROOK  
 Emilie du Chatelet introduced Isaac Newton to the French and  
 Mary Somerville introduced England to Pierre-Simon Laplace.

ENYA  
 They *translated* great *men's* ideas...

IRIS  
 Haven't you been paying attention? Neither woman could just  
 be called a translator. They translated *and* explained  
 everything because they *understood* everything. They were  
 good communicators, teachers. In a world, in a time, when  
 (MORE)

IRIS (cont'd)

people couldn't even write their own names! How is that not...genius?

JADE

To teach something well you have to know it well!

ENYA

None of them discovered or changed anything!

BROOK

Emilie du Chatelet nearly discovered the nature of fire!

ENYA

Again with the nearly!

BROOK

She just didn't have thermometers because Voltaire was competing with her with his own experiment and was using them!

ENYA

Typical! Emilie du Chatelet nearly discovers the nature of fire but not wanting to compete with her lover, not wanting to hurt his pride, she hands over the thermometers to him so he can carry on with his little experiment! Emilie du Chatelet took a back seat to Voltaire. That's why everyone only knows her as his lover! What a stupid period of history! The very same impulses that sparked humanity to "sweep" the skies with telescopes sparked the French revolution and what do these sons and daughters of the great Enlightenment do? I'll tell you what they did. They cut the head off, of the one great man who actually solved the riddle of fire. We might still believe in phlogiston without Lavoisier! He-- a man, not taking the back seat to anyone-- discovered the nature fire. Now *that's* genius! Emilie du -- of-- her husband the Marquis and the lover of Voltaire didn't discover the nature of fire. Lavoisier did!

BROOK

With his wife! You're forgetting his wife!

ENYA

She was an artist!

BROOK

She worked along side him! Made the illustrations, published his notes. She was the one communicating with us!

ENYA

For what? He discovers the nature of fire and he. Lost. His. Head! Learn from history! Enlightenment! Winthrop can shove this stupid assignment up her Uran-/

JADE

Caroline Herschel didn't take a back seat to anyone! She rode six hours to Greenwich in the middle of the night, sidesaddle--do you know how hard that is? Sidesaddle with only "one hour's sleep" just to stake her claim to her eighth comet!

ENYA

She also called herself a well-trained puppy dog. Don't you understand. Second place isn't good enough. *Nearly* just isn't good enough. Not in today's world where we have photographs of photons and black holes! We've wasted our time this afternoon! With all of it!

IRIS

(brightly)

Well, at least I'll pass my history test.

JADE

Back then women *had* to appear modest-- you *don't* Enya! Don't listen to your mother or your brother. You can *be* your own trumpeter! We've heard a lot today/

ENYA

All I've learned today is that science has changed drastically in three hundred years, but the world really hasn't. Women still backbite one another, mothers hold daughters back and while some men support the women around them --even when they're smarter than they are-- they are few and far between.

They let this sink in.

JADE

Enya's right. Ada's vision didn't change anything. Babbage's machines were never made. Too expensive. Too hard to convince others of what he and Ada could see but others couldn't.

Ada Lovelace in bonnet watches a horse race, nervously. Sound of the horses as they start, crowd.

BROOK

While Emilie du Chatelet used her mathematical skills to win at cards to buy herself books, young Ada's mathematical skills fated her to follow in her wild, Romantic, poet father's footsteps. She started betting, taking great risks at the races and ended up losing very badly indeed.

Sounds of a horse race and the announcement of the winner. Ada

turns slowly to the audience in  
defeat. And great humility

ADA BYRON (LOVELACE)

*Greatness of the very highest order, is never appreciated here, to the fullest extent, until after the great man or woman's death. (thoughtfully) My ambition should be rather to be great, than to be thought so.*

The girls are silent for a moment.

BROOK

(hopefully)

Well... if we need to cut the Romantics, then we can add Lady Mary Montagu. She helped bring about the end of small pox.

ENYA

Great, another Mary.

THE PAST

**SCENE FOURTEEN - ANOTHER MARY**

Sounds of Constantinople.

LADY MARY MONTAGU, dressed in Turkish-inspired/English dress, composes a letter with quill.

LADY MARY MONTAGU

*I am going to tell you a thing that I am sure will make you wish yourself here, with me, in Constantinople. Far away and safe from the pox that rages through our land. The small pox, so fatal and so general amongst us, has here been made entirely harmless by the invention of engrafting. There is a set of old Women who make it their business to perform the Operation. I am patriot enough to take pains to bring this useful invention into fashion in England, and I should not fail to write to some of our Doctors very particularly about it, if I knew anyone of 'em that I thought had Virtue enough to destroy such a considerable branch of Revenue for the good of Mankind.*

Atmosphere of Turkey is broken.

ENYA

Edward Jenner invented the smallpox vaccine, not Lady Montagu!



BROOK

Yeah, but eight year old Edward Jenner might have died from smallpox had she not brought inoculation to England when she did! And without Jenner's contributions, without his observations and curiosity to look into what was considered an old wives' tale about milk maids being immune to small pox, we may never have wiped it out! Great discoveries come about due to the the slow progress of many, remember!? Edward Jenner observed lowly milk maids and Lady Mary Montagu entered-- where no man could go-- and observed old Turkish ladies. Saw it worked and then inoculated her own children/

ENYA

She experimented on her own children?! Risked/

BROOK

What was she supposed to do? She wanted to spare her children the scars she had! Scars or... worse. She did what any mother would for her children having seen that it worked! It took time to convince everyone back home, but she persisted and soon, with her connections, the royal family brought it into fashion. And saved Edward Jenner's life.

Lady Mary speaks to the audience.

LADY MARY MONTAGU

As a child, I had the *desire of catching the setting sun* and would run across the meadow to *catch hold of the great golden ball of fire sinking on the horizon*. I've always run after *the impossible*.

ENYA

Lady Mary Montagu wasn't a scientist, she was just a poet!

IRIS

She was an observer!

ENYA

Okay, we've learned a lot today about history, astronomy... you want a physics lesson? We're supposed to learn from each other, right? So here's some physics: in the quantum world, observers just get. in. the. way. (sighs in frustration) Don't you understand? Newton had it wrong. Even Einstein had it wrong. God *does* play dice with the universe! We don't live in a perfect clockwork universe! Nothing can be determined! It's all chance. Probability. What's the point of an astrolabe or any other machine if we can't predict anything with it?! Stop anything? We all just keep marching along together through what we think is a perfectly designed universe until it starts...swinging --back and forth, back and forth-- as we all fall inevitably into step with one another. Forced...? Maybe? Probably? Because of some weird

spooky quantum entanglement we can't see, predict or control. And then one perfectly fine afternoon is ruined. Snap. Bridge closed until further notice. (pause) Yes. I stole the astrolabe and ripped it into tiny little pieces! But my brother didn't make it, I did. He submitted it to the contest and it came in second place. (pause) It was just pieces of cardboard. And so what if we know where we are on land, or on sea, or anywhere!? Big deal! We're still between a rock and a hard place, because if everything is already determined, what's the point? And if *nothing* can be determined, we can't predict or control anything.

Silence.

IRIS

I'm sorry, Enya. I knew about your father, of course. But I didn't know about... I know your mother is always talking about your brother and is worried about him, but I didn't think it was that bad. How could she let him take the credit...? How could you...? (pause) My mother is always pushing me into the sciences. Doesn't understand that I love poetry, literature, the theatre! I'll probably never have a normal day job. And she's worried. I understand. It's hard to be a parent, I think. We'll know maybe, someday.

BROOK

(gently)

I am sorry about your father, too, Enya. I really am. (pause) The universe is chaotic. (resignedly) It's true. We can't predict the weather. Avoid accidents. (pause) I can't avoid accidents. (pause) You laughed, but I probably do have some sort of disease. Narcolepsy? I don't know. I blame the universe. No, we can't predict anything. I can't predict when I'm going to fall asleep next. I shouldn't even be here today. I had a doctor's appointment. With a specialist. We've been waiting for months. But my mom didn't excuse me from having to come today... because she's embarrassed. She doesn't want to tell the school. She's ashamed. Of me.

IRIS

Oh, no Brook that can't be true. She loves you./

BROOK

The first time my knees went weak on the playground. Years ago. She ignored it. Said I was making it up. Went back to blowing my little sister's nose. After my little brother was born she'd curl up next to me I as napped. She was so tired she didn't notice how often I was falling asleep. But then on the short drive to school it started. And it's getting worse. I see her eyes looking at me in the rear view mirror but she doesn't say a word. Now it's when I'm walking somewhere. Together with her or alone. I try not to give in, but.. I can't keep myself from falling asleep. She thinks --

like everyone thinks--that I'm lazy. I'm not lazy! There's something wrong. And now we --I-- have wait another month for an appointment 'cause I'm here writing what you're calling a stupid essay!? I for one have learned a lot today--probably more than I've learned all year. I am sorry about your father. I am sorry the world isn't perfect. But damn it, Enya. I was really enjoying it.

There's an awkward silence.

JADE

I am sorry to hear about your father, too, Enya. And your mother not supporting you. (pause) I walked in on my sister as she was opening my display cabinets the other day. In my room. Bugs everywhere. My parents were furious. But not with her, at first. With me! Like it was my fault. Thankfully, she told my dad the truth and they're letting me start my collection over again. But I had some of the rarest specimens...and now they're out there...somewhere. So I keep looking. (No one wants to know about her bugs, she gets it) Well, the way I figure it, it's like Mary Anning's fossils. Why did the dinosaurs die out after living on the earth for hundreds of millions of years? Asteroid or comet or whatever crashed into earth and okay. We sometimes have to start over. Life. It forces us...to change, evolve. But you're not fooling anyone, Enya. Maybe yourself, just a little. We've not wasted any time today. It's not some stupid period of history. We've learned something today. We all have. We've learned we don't have to sneak reading math books under our covers by candlelight. I don't understand why you'd let your brother take credit for your work!? You have a choice. You have to stand up for yourself. You said it yourself --what's wrong with these women?! You can be your own trumpeter! We have the choice. Okay, we didn't have the choice to be here, today but Ms. Winthrop's given us a little nudge in the right direction. Right? External force? We can learn and change or just go home today. Keep things as they are. (pause) All I know is that life carries on, Enya. (thinking of her bugs) Out there...somewhere.

IRIS

Like it or not, it's not some...machine you can study and work out and perfect to try to avoid --tragedy-- and while it might not tick along perfectly, it *is* the best of all possible worlds, Enya. Because it's the only world we have. Teachers, poets, scientists, students whatever-- we're all subject to the same laws of the universe-- whatever they are! Whether we understand them or not. What else *is there* for us to do but observe?

We hear the sounds of a mechanical machine winding up.

SCENE FIFTEEN - THE MACHINE

THE PAST,  
LONDON 1833

Mary Somerville, Ada Lovelace and Charles Babbage stand looking out to the audience at a machine. But to heighten the surprise on this day of her "coming out," Mary covers Ada's eyes either with her own hands or silk scarf. Ada is giggling with excitement.

MARY SOMERVILLE

(whispering) It's quite something, Ada. Just wait. Mr. Babbage, I say this with all due respect to your genius, but I feel quite sure Ada will understand it and its potential even better than you do.

Mary drops her hands/unties the scarf and Ada's eyes widen in surprise.

MARY SOMERVILLE

She has such an imagination.

Mary drops her hands/unties the scarf and Ada's eyes widen in surprise. Sounds of the machine's cogs grow louder, whirring, moving, filling the space. Mesmerizing.

ADA BYRON (LOVELACE)

Why Mr. Babbage. (pause) Thank you for showing me this. *It is a ...thinking machine!*

CHARLES BABBAGE

*It can raise numbers to the 2nd & 3rd powers/*

MARY SOMERVILLE

and extract the root of a Quadratic Equation!

CHARLES BABBAGE

And will print the results... (emphatically) removing all human error.

ADA BYRON (LOVELACE)

*Understand well as I may, my comprehension can only be an infinitesimal fraction of all I want to understand.*

CHARLES BABBAGE

"What we know is not much. What we do not know is immense."

ADA BYRON (LOVELACE)

Didn't Laplace say that?

CHARLES BABBAGE

Yes. (pause) This is only a small part of the full engine I've designed. A Difference Engine. I've plans for another machine Miss Byron even more ...ambitious... if you'd like to see them. An Analytical Engine.

ADA BYRON (LOVELACE)

More ambitious than this!? Oh yes... I would be most honored Mr. Babbage. (smiles and continues to observe the machine) *The more I study the more I see that Mathematical science shows what is. It is the language of unseen relations between things. [But] Imagination too shows what is...[what is possible] Imagination allow[s] us to enter into the worlds around us.* Do you not wish to enter into the worlds around us? To find out if this is indeed the best of all possible worlds?

The whirring and sounds of the machine grow as if the machine is running in its fully realized form. Enormous. A wonder to behold.

Babbage holds up a glass in a toast.

CHARLES BABBAGE

*To Imagination!*

Historical characters from earlier scenes and the four girls join in the toast as well. And then freeze.

ALL

Imagination!

MARY SOMERVILLE

*It pierces beyond the telescope; it sees a new multitude of worlds infinitely larger.*

THE PRESENT

### **SCENE SIXTEEN - THE ESSAY**

Ms. Winthrop enters. Picks up a letter from her desk and a few pages of an essay. The Four Girls enter, "reading" the letter aloud.

BROOK  
 Dear Ms Winthrop,  
 Here is our essay/

ENYA  
 Written by all of us.

BROOK  
 Your intention to force us into some sort of enlightenment  
 worked.

ENYA  
 Thank you.

JADE  
 See you Monday

IRIS  
 Sincerely -- The Physics for Poets...

Enya interrupts Iris gently.

ENYA  
 The Poets for Physics...

ALL  
 THE POETS FOR PHYSICS CLUB

They move into a curtain call.

JADE  
 ps Halley's Comet returns in 2061!

END OF PLAY