The plot: DARKNESS IN THE CLASSROOM

Characters:
S_1: arrogant, impudent: Richard
S_2: easy minded: Alan
S_3: neutral: Ivan
S_4: gossipy, ditz: Marie
S_5: ditz, foolish: Albert
S_6: gossipy, ditz: Rita
S_7: serious, rational: Margareth
S_8: neutral: Samantha
S_9: nerd, clever: Stephen
Miss. Bell
Mr. Wilson

SCENE 1

CHORUS (*dressed as planets*): "Hi! We are the planets of the Solar System. "Today we are going to go along with you during this show." "But shhh, they are coming!"

All the students except S_1 are in the classroom; they are reading something or chatting in small groups.

S_2: "Hey, where is S_1? Just now I notice he is missing."

S_3: "The headteacher called him. Possibly he is in trouble!"

S_4: "Why?"

S_5: "You know there's that statue by the back of the school yard? He put a beret on the statue and a cigar between his lips, so that it looks like Fidel Castro. I guess it was him, I saw him hanging around with a beret yesterday."

S_7: "OK. Be serious. What happened?"

S_1 (*gets on the stage, a little angry)*: "Stupid teachers! All of them. They go on sick leave and think they can ask us to work. No teacher no work. Is there anybody here willing to play cards? We can organize a tournament, I have got three decks!"

S_7: "Be serious, I say again! Who assigned which work? If we have to do, the sooner the better! Then we are free. You know they will check."

S_1: "Miss Bell asks us to work while she is not here and this is not fair!"

S_8: "Miss Bell is such a pain!"

Planet X: "Oh I don't like this girl! Do you?"

Planet Y: “Yes I agree! She is really unfair.”

S_1: To tell the truth we only have to answer to a stupid question asked by miss Bell. Ten seconds of our time, to tell the truth. However, it is for us a question of principle to resist against the work!

S_2: By the way, what is this question?

S_1: Don't we fight for our rights?

S_3: Let's make miss Bell happy in ten seconds and then we can play cards with a quiet conscience.

S_1: OK. We are in democracy, if you all agree...

S_2.....S_n (*chorus*): Yes, we agree!

S_1. OK OK, the question is “Why is the sky dark at night?”

S_3: Only that?

S_1: Definitely!

S_4: Very good, we are lucky, I know the answer!

S_5: You know something? This is a scoop! Is it snowing?

S_4: That's very nice of you! But as it happens I can answer the question: obviously the sky is dark at night because the Sun faces the other side of the Earth, and being shadowed by our planet its light can't reach us. As simple as that for me.

Planet S: “Is she sure? The question isn’t so simple...”

S_2: Excellent, where are the decks of cards? I am feeling I am lucky today...

S_1: Here they are. Do not waste other time in meaningless questions...

S_7: Hey you geniuses, the problem is not so simple.

Planet B: Oh, much better. Finally a nice girl.

S_6: Why? Do you know a better answer?

S_7: I don't have the answer...

S_5: ...but you are going to complicate our life all the same, aren't you?

S_7: Please, don't interrupt me. As I was saying I don't have the answer but I know that a lot of different answers have been given in the past to this apparently simple problem.

Everyone look in the direction of S_9, the genius of the class

S_9: Margareth is right. The question is much more complicated than it appears, and S_8 is right too: Miss Bell is such a pain! We'll have to work on this problem for the rest of the day!

S_2: I really can't see how this could be a problem, no sun → no light → dark sky → problem solved → card playing begins!

Planet F: (*shocked*)"Wait, wait, wait... Is he serious? Tell me he's joking!"

Planet D: (*laughing*) "I don't think!"

S_7: And the stars?

S_5: What have the stars to do with this?

S_7: Stars are not dark! They shine, and twinkle, twinkle as you wonder what they are...

S_4: How tender... but they are tiny and far, and so little is their light.

S_8: Yes but they are quite a lot, aren't they? How many do you think?

S_4: Infinite, I suppose... am I wrong?

S_9: Try to answer by yourself. If they are infinite, all together they should make an infinite light, but this is not the case, since the sky is dark!

Planet J: "I think this guy will find the answer to the question"

S_2: OK, so stars are not infinite, problem solved. Let's play cards!

S_9: But if they are not infinite, why don't they collapse into one place? If you remember there is a thing called gravity that pulls things together...

S_5: But in this way, you say that stars cannot be either infinite nor finite. Are you contradicting yourself? Decide for one or for the other and let's play cards!

S_7: S_9 is only trying to make it clear, that the question is not trivial at all. So forget the cards and let's decide how to answer to the question!

S_2: Let's take a look at the web! Maybe we find a ready-made answer to the darkness at night issue and we're done! Remember: I want to play cards!

S_9: Ok, let's try. But I think the work is going to be harder!

SCENE 2

The stage must be divided in two parts: Students and planets vs. Philosophers

Students going to one side of the stage, other parts of stage are dark (so we have time to bring the scenery, stuff for the Greeks)

S_7: So we can admit, we don't know the answer. We will need help. Let's go to the library!

S_4, S_5, S_6 laugh & „cries": No way! Not to the library!

S_2: We will never get to play cards I guess…

S_1: All of you are useless… Find a way to solve this problem, or start playing cards finally; otherwise I am leaving you alone!

S_3: We could ask the Greeks, if you think…

S_1: Not the Greeks again! They will talk about nothing for ages, and we will never find the answer. Philosophers do not know anything, they will just confuse us.

S_7: At least we have to start somewhere. I agree with Ivan, we should ask the Greeks.

S_9: Well, that's a good start…

S_3, S_4, S_5, S_6: Then let's ask them quickly.

S_7: Samantha! Do you have your laptop with you? Text the Greek Philosophers now!

S_8: Sure. Oh, super, they are online!

video: students typing "Hey"

The sound of Facebook Messanger. The Greek part of the play gets alighted. 3 Greek Philosophers playing cards around a table, they have a laptop with them.

Philosopher_1: Aristotle

Philosopher_2: Zenon

Ph_1: Guys! Our favourite groups of students just texted us. They say "hey"

video: Greeks typing "May gods be with you, kids"

Ph_1: Do they need help in history again?

Ph_2: Ask them if they could send us coffee! I drank the last this morning…

video: Greeks typing "History again?"

S_7: Tell them, it's about physics.

S_1: Ask them why the sky is dark at night, and then we can leave them alone…

video: students typing "Nope :) Physics this time…"

Ph_2: Physics? There is so much more in this world than wondering about matter, like drinking coffee…or playing cards.

Ph_1: Zeno, please. They will send us neither coffee nor cards, nor will they give us predictions about our future, unless we help them.

video: Greeks typing "Interesting :) what's exactly?"

S_1: Why taking ages to ask a simple question?? Bet they couldn't find the letters to type…

S_8: Now I am asking why the sky is dark at night. Wait for a minute, and we can play cards if you still want to…

S_9: In case they understand our question…

video: students typing "Just a simple question: Why is the sky dark at night?"

Ph_1: They are asking why the sky is dark at night…

Ph_2: Oh, gods of Olympus! People getting stupider with time… how nonsense question!

video: Greeks typing "???"

S_2: Oh no… It's happening again… I'd rather be playing cards…

S_1: Ha! They don't even understand, just as I said. They can't help us.

S_9: Samantha, let me explain them the Olber's paradox.

S_8: The what?

S_9: The question we are talking about is called "Olber's paradox", it deals with…

S_1: Okay we don't care. You go, genius.

S_9 sits down to the laptop to type

video: students typing "You know, if the universe is infinite in space and time, there are infinite number of stars. If there are infinite stars, we should see a star every distance we look from, and since they have infinite light, the sky should be bright at night."

Student part of stage goes dark.

Ph_1: That's interesting. They think the universe is infinite. It's not, though.

Ph_1 stands to the table and start explaining a chart/drawing

Ph_1: This is the Earth in the middle of the universe. Here are the layers of sky, you see. To reach harmony, there must be 55 of them. These are crystal spheres, from which stars and the planets hang. And the background colour is dark. So simple, no mystery at all. I will text them back.

Planet_1: Oh no… Poor students…

P_2: This is not the way they will find out about darkness…

P_3: I still don't understand why they chose the Greeks to ask…

P_4: They didn't even understand the question…

P_5: Let's hope Zeno will correct Aristotle wrong theory…

Ph_2: So, Aristotle, if you say, the universe is not infinite, then

Ph_2 stand up and show a drawing

Ph_3: than what would happen if you throw a spear from the last star? Would it fall? Could it fall? Would it hit a wall? Would it break one of your crystal layers?

Ph_1: Probably. Maybe… or maybe not. I will answer when I get to the last star of universe. What should I say then to kids of the future?

Ph_2: Say the question is no important, and ask them coffee

video: Greeks typing "Idk"

Greek part of stage goes dark.

S_1: They don't know… what a surprise.

S_9: Of course they don't know. This question had no sense at their time; they believe the universe isn't infinite.

S_8: Should I say them god-bye or we wanna ask something more?

S_7: Ask them, what a star actually is.

S_3: We know that, don't we?

S_4: Why is it interesting for us now?

S_2: Can we play cards finally?

S_7: Okay, then let's say goodbye.

S_8: Wait! They just sent us a photo.

video: Greeks typing "Anyway, could you, dears, send us a few pounds of coffee? Thanks :*"

S_1: Gosh… I cannot believe this…

S_7: Sure and say we are in a hurry, so goodbye.

video: students typing "Sure, we will. We have to find the answer for the question, so we have to say goodbye :)"

video: Greeks typing "Bye!"

SCENE 3

(The stage is divided into two sides. On the left there are the students and here develops the scene below)

S_7: Wow that was amazing! Don't you think?

S_4, S_6, S_5, *laugh*

S_7: What are you laughing for? You don't understand anything! You silly girls…

S_3 : Hey, keep calm!

S_4: At least I wear Prada.

S_2: Praga? I've been there! Wonderful city, lovely…

S_5: Oh man, what is wrong with them…

S_3: Come on guys! Let's concentrate, we have to figure this out if we want to survive Mr/Mrs, can we talk about the video?

S_7: Thanks god….Finally someone who can use his brain. Well, personally I liked it a lot, I found really interesting their way of thinking, searching answers even if it was really hard for them without our technology and devices.

S_1: Yes okay, I see what you mean. Even if they were really determined they didn't discover anything useful for us.

S_3: Honestly, I disagree with you, they gave us the foundation for theories close to ours.

S_8: Ok, but what about Aristotele and Zeno from Cizio? They just talked nonsense. Even Rita knows that the Earth isn't at the centre of the universe.

S_6 (*laughs)*: Of course I know, there is Jupiter at the centre!

S_8: Please stop it let's talk seriously!

S_3: Yes you're damn right! But where is the brain of our class?

S_1: Hey guys, he is sleeping! Good night princess!

S_4: let's take a selfie with him!

Chorus: "Sleeping he is, but his mind is working hard, and in his dreams something special is happening."

(Now the attention moves from the students to the dream [on the right of the stage]. Here turn up Galileo and S_9 who's dreaming)

S_9: What's happening here? *(waking up in his dream)*

GG: Good morrow. Did you sleep well, didn't you?

S_9: Good morning. I apologize. I've never seen you before. Are you a substitute?

GG: No, I'm Galileo Galilei: it's a bit that no one dreams me!

S_9: So… I'm sleeping! I have to wake up!

GG: You can't! You have to stay with me for a while. Let's spend some time talking about universe's theories. The last speech I had on this topic was with Edward Harrison.

S_9: Ok. It will be interesting. Just now I realise that somewhere in my mind lies the question "Why Is the sky dark at night?"; I know quite a lot about astronomy but it would be nice to hear the opinion of a scientist like you.

GG: So you are interested in talking about the dark night sky. It's an old problem, it's called Olbers' paradox, but it's been risen quite a lot before Olbers' birth.

S_9: Indeed, it was Mr. Digges the first to write something about it, wasn't he?

GG: Yes, he rejected the idea of the sphere of stars, and believed in an infinite universe with an infinite number of stars.

S_9: And there came the problem. Where has all that light gone?

GG : All that light, yes. Do you miss it? Someone thought that we, inhabitants of the Earth are a miserable sort of people...

S_9: Well, maybe that's what we are! We have very dark nights, and when it is day we never see more than the Sun! Would not be better a world full of light?

GG: You have some point, my dear, but why do you think I have become so famous?

S_9: Because you are really clever?

GG: That's absolutely true, but not enough!

S_9: Well, you have been the first who has watched the sky with a telescope, you discovered the Jupiter satellites, you...

GG: Great, and at what time of the day do you think I have been spending hours and hours with one eye closed and one opened staring in a tube with a glass piece on the top and another one at bottom?

S_9: Now I understand, of course it was at night. And darker the night is, than better the view will be! Do you remember how Mr. Digges solved the problem?

GG: Yes, I do. If I put on a candle here you can see it without any problem, but if I start walking, with the candle in my hand, even if nothing is interposed between us, you can understand the further I go the feebler you see the light. It was simply this for him: far stars are far too feeble to be seen.

(The attention moves from Galileo to the students. S_9 is sleeping on the table and he is speaking while he is dreaming. The students comment his speeches.)

S_9: *(While he's sleeping)* Oh yes, this was a good answer, until the calculations of Mr.Cheseaux: if the universe is homogeneous, and it is on the right scale, the feeble light of an infinite number of stars makes much more light than what we get.

S_1: He has already a lot of problems, in addition to them he speaks while he's sleeping!

S_7:Shut up! We must listen to him and take notes about what he's saying.

S_8: This guy has a scary mind. He thinks also when he sleeps.

(Returning to the dream)

GG: And so the problem is still open. Even that brainless man that was called Kepler gave him stupid answers.

S_9: Why do you say Kepler was brainless?

GG: Don't worry, ancient grudge. Anyway he didn't see the problem, for him the darkness was just the proof of the existence of a dark cosmic wall, outside the sphere of the fixed stars.

S_9: How far from the truth!

GG: He wasn't alone, after all, in sticking to the ancient theories. The stoic idea of an island of stars, our Milky way, in the middle of nothing have been an answer good enough for some extraordinary mind.

S_9: Some of the ancient theories where not so far from what we know now. The cosmological principle, for example, was somehow already clear to the ancients.

GG: Yes, the universe is everywhere the same, thinking big enough. And this ruins another great idea about the solution of the paradox.

S_9: And which one was it?

GG: Herschel proposed a sort of fractal universe, where we could have an infinite number of stars that spread away in an infinite space, but with decreasing density, like a little bush which is in a collection of further bushes, which is in a collection of further collections, and so on.

S_9: This could have solved the problem, but as we already said, until the cosmological principal holds... I can see nonetheless another great idea, hidden in this already very great idea

GG: The idea of a universe composed by many islands you mean?

S_9: Yes, until not so long ago no one was sure if the milky way was or not the only galaxy.

GG: Step by step we are getting somewhere, but we have not explained the paradox yet.

S_9: We talked about Cheseaux, and we said he hadn't fell in the trap of the faint stars. He fell in another one.

GG: He fell in a thermodynamic trap, and it occurred the genius of Sir Kelvin to rescue us.

S_9: It was an obvious answer, and the same argument has been held by Mr. Olbers himself!

GG: Of course if you are sure there is lot of light coming, but you don't see it, what you think about something blocking it?

S_9: Interstellar dust, it is simple, who says that the universe has to be transparent?

GG: You can't see the candle I'm holding if I am too far, but you can't see either if there is something between it and your eyes.

S_9: But here comes a really important idea we have not touched so far.

GG: Of course at that time everyone believed that the universe was infinite in time. And a star that emits light since ever would have time to warm up the interstellar dust to some temperature.

S_9: And as we now know, this temperature is the equilibrium temperature, and this dust, as hot as a star, irradiates the radiation it receives, that is just as blazing as the star.

GG: God bless Kelvin! Even if you know I am from the old school, and here begins something that has been really hard for me to swallow!

S_9: Do you know the work of such a man? Was not him to tell that there are no paradoxes in science?

GG: This is what he said, and of course also the Olbers' paradox couldn't escape him. He found the answer.

S_9: He considered the point at issue.

GG: With some numbers and a few calculations he solved the riddle of darkness at night in the framework of a transparent, uniform and static universe!

S_9: Static, yes, but so big. Even if you seem quite old nothing lives for ever, and this holds for the stars, too.

GG: Indeed, Kelvin assumed that all the stars did not begin to shine infinitely many years ago. Knowing the average lifespan of stars and using a rough approsimation for the density of stars in our galaxy he concluded that most of the light hasn't reached us yet.

S_9. We now know that not only the stars aren't infinitely old, but the whole universe. There hasn't been enough time for light to reach us. Not to talk about the expansion. A lot of redshifted light we can't see with our eyes!

GG: Thanks to Hubble we know that our universe is quite old, yes, but not infinitely old, and it is expanding, and this two facts are the main solutions of the paradox.

S_9: There are more theories about the creation of the universe. The prevailing one, in the scientific community, is the famous big bang theory, there are more observational evidences in its favour.

GG: And one them tells us that the sky is not dark at all!

S_9: What do you mean?

GG: I am sure you know what the cosmic microwave background is!

S_9: Of course I know it!

GG: It is light, it is light we are not able to see. If we had better eyes the sky would not be dark at all!

S_9: You are right old man.

GG: When we look far away we are looking back to the past. Of course we could never see what was out there before the very beginning, but we see that there was a lot of light! There are no paradoxes in science! Kelvin was right on this point.

S_9: He was right, but still he had not the right image of the universe.

GG: Well, do you think you have it?

S_9: Of course, I have studied everything I had at hand, and today you can have almost everything at hand!

GG: You are young, and probably I was like you in my best days. I was sure of many things, and then I discovered I was wrong on most of them!

S_9: But that was a long time ago, scientific development is incredible today.

GG: You have a lot to learn, dear boy, but not in this dream! Wake up. You must show this video to your classmates. *(Galileo gives to S_9 a USB pen drive)*

(S_9 wakes finally up and talks to his classmates. He is searching for his USB pen drive in his pocket)

S_9: Galileo gave me a video. Let's watch it, it may be helpful!

S_1: Oh my God! He will never stop to surprise me. He's mad.

S_2: The earlier we begin, the earlier we will finish.

(Video by the Germans)

SCENE 4.

CHORUS: the task is almost completed, but there is still something to discover...

S_1: So here we are guys, we solved the mystery. The teacher will be happy, he got to ruin our day!

S_8: To tell the truth it's been intriguing, hasn't it?

S_5: The teacher is not here, so you don't need to sound as the perfect student!

S_3 *(to S_5):* I saw you were interested, too, dear S_5.

S_5: Maybe, but a little bit only.

S_2: How hard has been to get the idea that the universe can change? In the past I mean. According to me I have always known that.

S_4: And why didn't you tell us before?

S_2:I wanted to see if you were able to reach the right conclusion without my help! I did it for you!

S_1: Yes, you got the help of the elementary school teacher, as everyone here...

S_9: This is the point, Kepler elementary school teacher didn't know what we know now! Kepler discovered something new, and others scientists and philosophers after him increased the knowledge of the whole mankind...

S_4: I'm not sure S_2 is part of the mankind...

PLANET B: sure! I totally agree.

S_2: Well, sure is I am more man than you!

S_6: I could say something about this...

S_7: Stop it, please! What I am not sure about, is the fact that science only is able to understand the truth.

S_3: What do you mean?

S_7: Scientists proved that we live in an expanding universe, that's true, but I know that a poet anticipated everything: the expansion, the possibility for the universe to collapse and be born again, and also the finite age of the universe, which helps to solve the Olbers' paradox.

S_9: Really? That's wonderful! Who is this visionary person, who escapes from my knowledge?

S_7: Never heard about Edgar Allan Poe?

S_2: He wrote mystery tales...

S_8: ...and poems...

S_7: … and about the universe, yes!

Poe enters with some kind of bird which he will insist in calling a raven. He doesn't seem to notice the students at the beginning. Then one of them strikes him lightly on his shoulder.

CHORUS: Oh my god! He is Edgar Allan Poe! How is it possible!?

PLANET C: Yes! It is my favourite writer!

POE: Who comes tapping to my shoulder? No one has ever done it before!

S_1: We are students, Mr. Poe, only this, and nothing more.

S_7: "Good afternoon, Mr. Poe. I am honored to be in the presence of such a relevant artist, even if some calls you mad"

POE: Good afternoon dear students! Yes, men have called me mad; but the question is not yet settled, whether madness is or is not the loftiest intelligence.

S_2: It doesn't surprise me that someone called you mad. It is enough for me to look at your strange bird.

POE: This bird you mean? Careful guy, this is not a strange bird, this is "the raven".

S_2: I see, I am impressed. Does it speak too?

POE: To tell you the whole thing...yes, indeed, but HE only says one thing.

S_5: *(trying to touch the bird)* Oh... never mind...

POE: "Nevermore", guy!

S_5: *(retreating, fearing Poe got angry)* I apologize, don't get mad, please!

POE: No, you can touch it if you want to, “nevermore” is what the raven says. Don't ask me why, anyway.

Planet C: Who calls him mad is not right, he is TOTALLY mad!

S_7: Mr. Poe, we spent the day trying to understand the universe, and in the end we realized that your intuition anticipated many scientists.

S_9: You are a poet, and a mystery writer, how happened that you could see so deep and so far without those instruments, so much needed by scientists?

POE: I am not different from a scientist, or from a philosopher, if what they search is some possible knowledge about our world. Some of my instruments can be different from the instruments of traditional science, but others are not. As you said I wrote about mysteries, but look at the story of any scientific discovery: what’s that, if not a tale of mystery and imagination?