No. _____

SOAL SELIDIK PELAJAR-PELAJAR REKA CIPTA TINGKATAN 5

Tujuan soal-selidik ini ialah untuk mendapatkan pandangan anda tentang mata Reka Cipta. Kami ingin mengetahui pendapat anda terhadap pernyataan-pernyataan yang diberikan. Ini bukannya satu ujian. Oleh itu tidak ada jawapan betul atau salah.

BAHAGIAN I : MAKLUMAT PERIBADI PELAJAR

Sila tuliskan pada ruang-ruang yang disediakan.

1. Nama dan alamat sekolah : _____
   _____
   _____
   _____
2. Jantina : _____
3. Umur : _____ tahun

BAHAGIAN II : MAKLUMAT TENTANG PROJEK REKA CIPTA

Definisi Konsep Sains:

Konsep Sains bermakna konsep, hukum atau prinsip yang berkaitan dengan mata pelajaran sains seperti Kimia, Fizik atau Biologi. Contoh-contoh konsep sains adalah `gerakan', `daya', `elektrik', `Hukum Keabadian Tenaga', `Prinsip Keabadian Momentum', `Hukum Hooke' dan lain-lain.

4. *Sila tandakan X pada SATU ruang sahaja.*

   Adakah anda menggunakan konsep sains dalam projek Reka Cipta anda?

   Ya [ ] Tidak [ ]

   Jika TIDAK, sila jawab soalan 4(a).
   Jika YA, sila jawab soalan 4(b).

4(a) *Jika jawapan anda di (4) TIDAK, sila tandakan X pada ruang-ruang yang berkenaan. Anda boleh tandakan LEBIH daripada satu.*

Saya TIDAK menggunakan konsep sains kerana :

konsep sains tidak diperlukan bagi projek Reka Cipta saya [ ]

saya tidak mahir menggunakan konsep sains [ ]

saya tidak tahu bahawa konsep sains perlu digunakan [ ]

konsep sains susah digunakan. Oleh itu, saya abaikannya. [ ]

saya tidak dapat memikirkan sebarang konsep sains yang boleh digunakan dalam projek Reka Cipta saya [ ]

Lain-lain sebab [ ]

Nyatakan :

_____

_____

_____

_____

4(b) *Jika jawapan anda di (4) YA, sila tandakan X pada ruang-ruang yang berkenaan. Anda boleh tanda LEBIH daripada satu.*

Konsep-konsep sains yang saya gunakan dalam projek Reka Cipta saya ialah :

cahaya	[ ]	bunyi	[ ]
biasan cahaya	[ ]	arus elektrik	[ ]
pantulan cahaya	[ ]	beza keupayaan	[ ]
serakan cahaya	[ ]	tarikan graviti	[ ]
haba	[ ]	rintangan	[ ]
suhu	[ ]	Hukum Keabadian Tenaga	[ ]
tenaga elektrik	[ ]	gerakan	[ ]
tenaga kinetik	[ ]	daya	[ ]
tenaga keupayaan	[ ]	graviti	[ ]
tenaga suria	[ ]	tekanan	[ ]
tenaga cahaya	[ ]	tenaga kimia	[ ]

Lain-lain [ ] Nyatakan: _____

_____

5. *Sila bulatkan 1,2,3 atau 4 bagi pernyataan-pernyataan berikut.*

Petunjuk : 1 Sangat tidak setuju
2 Tidak setuju
3 Setuju
4 Sangat setuju

Pada pendapat saya, dalam projek Reka Cipta,

a) konsep sains tidak penting	1	2	3	4
b) konsep sains diperlukan untuk memahami bagaimana projek berfungsi	1	2	3	4
c) konsep sains membantu dalam pereka ciptaan	1	2	3	4
d) saya tidak perlukan konsep sains	1	2	3	4
e) konsep sains membantu saya menerangkan bagaimana projek berfungsi	1	2	3	4

BAHAGIAN III : MAKLUMAT TENTANG KELAS REKA CIPTA

6. *Sila tandakan X dalam SATU ruang sahaja.*

Dalam kelas Reka Cipta, saya :

selalu menggunakan konsep sains [ ]
kadang-kadang menggunakan konsep sains [ ]
jarang menggunakan konsep sains [ ]
tidak pernah menggunakan konsep sains [ ]

7. Adakah anda menghadapi masalah semasa menggunakan konsep sains dalam kelas Reka Cipta?

Ya [ ] Tidak [ ]

Jika YA, sila tandakan X pada ruang-ruang yang berikut. Anda boleh tandakan LEBIH daripada satu.

Semasa menggunakan konsep sains dalam kelas Reka Cipta, masalah-masalah yang saya hadapi ialah :

a) saya tidak faham dengan jelas beberapa konsep sains yang digunakan [ ]
b) saya tidak dapat menerangkan konsep sains yang digunakan [ ]

c) konsep sains susah diaplikasikan [ ]

d) saya hanya meneka sahaja konsep sains yang digunakan [ ]

e) saya tidak tahu bagaimana untuk mengaplikasikan konsep sains [ ]

f) saya sering tidak dapat memikirkan konsep sains yang sesuai [ ]

8. *Sila tandakan X pada ruang-ruang yang berikut. Anda boleh tandakan LEBIH daripada satu.*

Cadangan-cadangan bagi mengatasi masalah-masalah di (7) ialah :

a) meminta bantuan guru [ ]

b) meminta bantuan rakan [ ]

c) meminta bantuan ibubapa [ ]

d) membuat rujukan [ ]

e) lupakan masalah itu dan fikirkan konsep sains yang lain [ ]

f) ubahsuai projek Reka Cipta agar dapat menggunakan konsep sains yang lebih mudah [ ]

g) Lain-lain [ ]

Nyatakan :_____

_____

_____

_____

_____

9. *Sila tandakan X pada SATU ruang sahaja.*

Pada pendapat saya, dalam kelas Reka Cipta, saya haruslah diajar konsep sains.

Sangat setuju	[ ]	Tidak setuju	[ ]
Setuju	[ ]	Sangat tidak setuju	[ ]

TERIMA KASIH DI ATAS KERJASAMA ANDA

No. _____

FORM 5 REKA CIPTA STUDENTS QUESTIONNAIRE

The purpose of this survey is to obtain your opinion on the Reka Cipta subject. We would like to know your opinion on the statements given. This is not a test. Therefore, there is no right or wrong answers.

PART I : STUDENT'S PARTICULARS

Please write on the columns given.

1. Name and address of school: _____

_____

_____

_____

2. Sex : _____

3. Age : _____ years

PART II : INFORMATION ON THE REKA CIPTA PROJECT

Definition of Science Concepts:

Science Concepts means, concepts, laws or principles related to science subjects such as Chemistry, Physics or Biology. Examples of science concepts are `movement', `force', `electricity', `Law of Energy Conservation', `Principle of Momentum Conservation', `Hooke's Law' etc.

4. *Please mark X in ONE column only.*

Do you use any science concept in your Reka Cipta project?

Yes [ ] No [ ]

If NO, please answer question 4(a).
If YES, please answer question 4(b).

4(a) *if your answer in (4) is NO, please mark X in the columns below. You may select MORE than one.*

I do NOT use science concepts because :

science concepts are not needed in my Reka Cipta project [ ]

I do not know how to use science concepts [ ]

I do not know that science concepts must be used [ ]

science concepts are difficult to use. So, I ignore them. [ ]

I could not think of any science concepts that could be used in my Reka Cipta project [ ]

Other reasons [ ]

Please state:

_____

_____

_____

_____

4(b) *If your answer in (4) is YES, please mark X in the columns below. You may select MORE than one.*

The science concepts that I use in my Reka Cipta project are:

light	[ ]	sound	[ ]
refraction of light	[ ]	electric current	[ ]
reflection of light	[ ]	potential	[ ]
dispersion of light	[ ]	gravitational pull	[ ]
heat	[ ]	resistance	[ ]
temperature	[ ]	Law of Energy Conservation	[ ]
electricity	[ ]	movement	[ ]
kinetic energy	[ ]	force	[ ]
potential energy	[ ]	gravity	[ ]
solar energy	[ ]	pressure	[ ]
light energy	[ ]	chemical energy	[ ]

Others [ ] Please state:_____

_____

5. *Please circle 1,2,3 or 4 for the statements below.*

Keys :	1	Strongly disagree
	2	Disagree
	3	Agree
	4	Strongly Agree

In my opinion, in Reka Cipta projects,

a) science concepts are not important	1	2	3	4
b) science concepts are needed in order to understand how a project functions	1	2	3	4
c) science concepts assist in inventing	1	2	3	4
d) I do not need science concepts	1	2	3	4
e) science concepts assist me in explaining how a project functions	1	2	3	4

PART III : INFORMATION ON REKA CIPTA CLASS

6. *Please mark X in ONE column only.*

In Reka Cipta class, I :

always used science concepts	[ ]
sometimes used science concepts	[ ]
seldom used science concepts	[ ]
never used science concepts	[ ]

7. Have you ever faced problems when using science concepts in Reka Cipta class?

Yes [ ] No [ ]

If YES, please mark X in the columns below. You may select MORE than one.

When using science concepts in Reka Cipta class, the problems that I faced were :

a) I did not understand clearly a few of the science concepts used	[ ]
b) I could not explain the science concepts used	[ ]

c) science concepts were difficult to apply [ ]

d) I only guessed the science concepts used [ ]

e) I did not know how to apply science concepts [ ]

f) I often could not think of any suitable science concepts [ ]

8. *Please mark X in the columns below. You may select MORE than one.*

My suggestions for overcoming the problems in (7) are :

a) request for the teacher's assistance [ ]

b) request for friends' assistance [ ]

c) request for parents' assistance [ ]

d) refer to books [ ]

e) forget about the problem and think of another science concept [ ]

f) modify the Reka Cipta project so that I could use easier science concepts [ ]

g) Others [ ]

Please state:_____

_____

_____

_____

_____

9. *Please mark X in ONE column only.*

In my opinion, in Reka Cipta class, I should be taught science concepts.

Strongly agree	[ ]	Disagree	[ ]
Agree	[ ]	Strongly disagree	[ ]

THANK YOU FOR YOUR COOPERATION

SOALAN TEMUDUGA BAGI PELAJAR-PELAJAR REKA CIPTA

1. Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?

2. Apakah konsep sains yang anda gunakan?

3. Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?

4. Apakah tindakan anda untuk mengatasi masalah-masalah tersebut?

   atau

   Apakah cadangan-cadangan anda untuk mengatasi masalah-masalah tersebut?

5. Pada pendapat anda, adakah konsep sains penting untuk Reka Cipta? Kenapa?

6. Pada pendapat anda, adakah konsep sains perlu diajar dalam kelas Reka Cipta?
   Kenapa?

INTERVIEW SCHEDULE FOR REKA CIPTA STUDENTS

1. Do you use any science concept in your Reka Cipta class?

2. What are the science concepts that you use?

3. What were the problems that you faced with regards to the application of science concepts?

4. What were the actions that you took in order to overcome these problems?

   or

   What are you suggestions for overcoming these problems?

5. In your opinion, are science concepts important for Reka Cipta? Why?

6. In your opinion, should science concepts be taught in Reka Cipta class?

Appendix C1

No. _____

SOAL SELIDIK PELAJAR-PELAJAR REKA CIPTA TINGKATAN 5

Tujuan soal-selidik ini ialah untuk mendapatkan pandangan anda tentang mata pelajaran Reka Cipta. Kami ingin mengetahui pendapat anda terhadap pernyataan-pernyataan yang diberikan. Ini bukannya satu ujian. Oleh itu tidak ada jawapan betul atau salah.

BAHAGIAN I : MAKLUMAT PERIBADI MURID
Sila tandakan X pada ruang-ruang yang disediakan.

1. Jantina : Lelaki [ ] Perempuan [ ]
2. Aliran : Sains [ ] Perdagangan [ ]
3. Saya mengambil mata pelajaran :

   Fizik [ ] Biologi [ ]

   Kimia [ ] Sains [ ]

BAHAGIAN II : *Sila tandakan X pada ruang yang berkenaan.*

Definisi Konsep Sains:

Konsep Sains bermakna konsep, hukum atau prinsip yang berkaitan dengan mata pelajaran sains seperti Kimia, Fizik atau Biologi. Contoh-contoh konsep sains adalah `gerakan', `daya', `elektrik', `Hukum Keabadian Tenaga', `Prinsip Keabadian Momentum', `Hukum Hooke' dan lain-lain.

4. Dalam kelas Reka Cipta, saya :

   selalu menggunakan konsep sains [ ]

   kadang-kadang menggunakan konsep sains [ ]

   jarang menggunakan konsep sains [ ]

   tidak pernah menggunakan konsep sains [ ]

5. Dalam kelas Reka Cipta, saya haruslah diajar konsep sains.

   Sangat setuju [ ] Tidak setuju [ ]

   Setuju [ ] Sangat tidak setuju [ ]

BAHAGIAN III: *Sila bulatkan 1,2,3 atau 4 bagi pernyataan-pernyataan berikut.*

Petunjuk :
1 Sangat tidak setuju
2 Tidak setuju
3 Setuju
4 Sangat setuju

6. Pada pendapat saya, dalam kelas Reka Cipta,

a) saya harus diajar konsep sains	1	2	3	4
b) konsep sains tidak penting	1	2	3	4
c) konsep sains diperlukan untuk memahami bagaimana projek berfungsi	1	2	3	4
d) konsep sains membantu dalam pereka ciptaan	1	2	3	4
e) saya tidak perlukan konsep sains	1	2	3	4
f) konsep sains membantu saya menerangkan bagaimana projek berfungsi	1	2	3	4

7. Dalam kelas Reka Cipta,

a) saya faham dengan jelas konsep sains yang digunakan	1	2	3	4
b) saya sentiasa dapat menerangkan konsep sains yang digunakan	1	2	3	4
c) konsep sains mudah diaplikasikan	1	2	3	4
d) saya meneka sahaja konsep sains yang digunakan	1	2	3	4
e) konsep sains adalah rumit dan saya tidak tahu bagaimana untuk mengaplikasikannya	1	2	3	4
f) saya tidak berapa faham beberapa konsep sains yang digunakan	1	2	3	4
g) saya sering tidak dapat memikirkan konsep sains yang sesuai	1	2	3	4
h) saya meminta bantuan guru/kawan sebelum menggunakan konsep sains	1	2	3	4
i) saya tidak menghadapai masalah berkenaan penggunaan konsep sains	1	2	3	4
j) saya sering membuat rujukan sebelum menggunakan konsep sains	1	2	3	4

8. Terangkan bagaimana projek Reka Cipta anda berfungsi.

9. Apakah konsep sains yang anda gunakan, sekiranya ada?

10. Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains dalam Reka Cipta?

11. Berikan cadangan-cadangan anda bagaimana masalah-masalah di (10) dapat diatasi.

TERIMA KASIH DI ATAS KERJASAMA ANDA

No. _____

FORM 5 REKA CIPTA STUDENTS QUESTIONNAIRE

The purpose of this survey is to obtain your opinion on the Reka Cipta subject. We would like to know your opinion on the statements given. This is not a test. Therefore, there is no right or wrong answers.

PART I : STUDENT'S PARTICULARS
Please mark X in the relevant columns.

1. Sex : Male [ ] Female [ ]
2. Stream : Science [ ] Commerce [ ]
3. I am taking these subjects :

Physics	[ ]	Biology	[ ]
Chemistry	[ ]	Science	[ ]

PART II : *Please mark X in the relevant columns.*

Definition of Science Concepts:

Science Concepts means, concepts, laws or principles related to science subjects such as Chemistry, Physics or Biology. Examples of science concepts are `movement', `force', `electricity', `Law of Energy Conservation', `Principle of Momentum Conservation', `Hooke's Law' etc.

4. In Reka Cipta class, I :

always used science concepts [ ]

sometimes used science concepts [ ]

seldom used science concepts [ ]

never used science concepts [ ]

5. In my opinion, in Reka Cipta class, I should be taught science concepts.

Strongly agree	[ ]	Disagree	[ ]
Agree	[ ]	Strongly disagree	[ ]

PART III: *Please circle 1,2,3 or 4 for the statements below.*

Keys :
1 Strongly disagree
2 Disagree
3 Agree
4 Strongly Agree

6. In my opinion, in Reka Cipta class,

a) I should be taught science concepts	1	2	3	4
b) science concepts are not important	1	2	3	4
c) science concepts are needed in order to understand how a project functions	1	2	3	4
d) science concepts assist in inventing	1	2	3	4
e) I do not need science concepts	1	2	3	4
f) science concepts assist me in explaining how a project functions	1	2	3	4

7. In Reka Cipta class,

a) I understand clearly the science concepts used	1	2	3	4
b) I am always able to explain the science concepts used	1	2	3	4
c) science concepts are easy to apply	1	2	3	4
d) I only guess the science concepts used	1	2	3	4
e) science concepts are difficult and I do not know how to apply them	1	2	3	4
f) I do not really understand some of the science concepts used	1	2	3	4
g) I often cannot think of suitable science concepts	1	2	3	4
h) I ask the teacher's/friends' assistance before using science concepts	1	2	3	4
i) I do not face problem with regards to application of science concepts	1	2	3	4
j) I always refer to books before using science concepts	1	2	3	4

8. Please give an explanation on how your Reka Cipta project functions.

9. What science concepts do you use, if any?

10. What are the problems that you face with regards to application of science concepts in Reka Cipta?

11. Give your suggestions on how to overcome the problems in (10).

THANK YOU FOR YOUR COOPERATION

No._____

BORANG `RATING' GURU-GURU REKA CIPTA

Tujuan borang ini ialah untuk mendapatkan pandangan anda tentang mata pelajaran Reka Cipta. Kami ingin mengetahui pendapat anda terhadap pengggunaan konsep sains dalam projek-projek Reka Cipta . Ini bukanlah satu ujian. Oleh itu tidak ada jawapan betul atau salah.

BAHAGIAN I : MAKLUMAT PERIBADI GURU
Sila tandakan X pada ruang-ruang yang berkenaan.

1. Jantina : Lelaki [ ]
Perempuan [ ]

2. Adakah anda seorang kakitangan sumber bagi Reka Cipta KBSM?
Ya [ ]
Tidak [ ]

BAHAGIAN II : PENDAPAT GURU TENTANG KONSEP SAINS DALAM PROJEK REKA CIPTA

Definisi Konsep Sains:

Konsep Sains bermakna konsep, hukum atau prinsip yang berkaitan dengan mata pelajaran sains seperti Kimia, Fizik atau Biologi.
Contoh-contoh konsep sains adalah `gerakan', `daya', `elektrik', `Hukum Keabadian Tenaga', `Prinsip Keabadian Momentum', `Hukum Ohm', `Hukum Hooke' dan lain-lain.

Arahan : Sila tandakan X pada ruang-ruang yang berkenaan. Anda boleh tandakan LEBIH daripada satu.

3. Pada pendapat saya, bagi tema Pencahayaan, Pengasingan dan Perlindungan (Reka Cipta SPM 1998), konsep-konsep sains yang mungkin digunakan ialah :

cahaya	[ ]	prisma	[ ]
biasan cahaya	[ ]	arus elektrik	[ ]
pantulan cahaya	[ ]	beza keupayaan	[ ]
serakan cahaya	[ ]	tarikan graviti	[ ]
haba	[ ]	rintangan	[ ]
suhu	[ ]	Hukum Keabadian Tenaga	[ ]
tenaga elektrik	[ ]	gerakan	[ ]
tenaga kinetik	[ ]	daya	[ ]
tenaga keupayaan	[ ]	momentum	[ ]
tenaga suria	[ ]	Prinsip Keabadian Momentum	[ ]
tenaga cahaya	[ ]	graviti	[ ]
tenaga kimia	[ ]	perubahan bentuk tenaga	[ ]
tenaga bunyi	[ ]	bunyi	[ ]
tekanan	[ ]	pemindahan haba	[ ]
Lain-lain	[ ]	Nyatakan: _____	

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

TERIMA KASIH DI ATAS KERJASAMA ANDA

No._____

RATING FORM FOR REKA CIPTA TEACHERS

The purpose of this form is to obtain your opinion on the Reka Cipta subject. We would like to know your opinion on application of science concepts in Reka Cipta projects. This is not a test. Therefore, there is no right or wrong answers.

PART I: TEACHER'S PARTICULARS

Please mark X in the relevant columns.

1. Sex :

Male	[ ]
Female	[ ]

2. Are you a resource personnel for KBSM Reka Cipta?

Yes	[ ]
No	[ ]

PART II: TEACHER'S OPINION ON SCIENCE CONCEPTS IN REKA CIPTA PROJECTS

Definition of Science Concepts:

Science Concepts mean concepts, laws or principles that are related to science subjects like Chemistry, Physics and Biology.
Examples of science concepts are `movement', `force', `electricity', `Law of Energy Conservation', `Principle of Momentum Conservation', `Ohm's Law', `Hooke's Law' etc.

nstructions : *Please mark X in the relevant columns. You may select MORE than one.*

3. In my opinion, for the themes Lighting, Separation and Protection (Reka Cipta SPM 1998 syllabus), the science concepts probably used are:

light	[ ]	prism	[ ]
refraction of light	[ ]	electric current	[ ]
reflection of light	[ ]	potential	[ ]
dispersion of light	[ ]	gravitational pull	[ ]
heat	[ ]	resistance	[ ]
temperature	[ ]	Energy Conservation Law	[ ]
electricity	[ ]	movement	[ ]
kinetic energy	[ ]	force	[ ]
potential energy	[ ]	momentum	[ ]
solar energy	[ ]	Momentum Conservation Law	[ ]
light energy	[ ]	gravity	[ ]
chemical energy	[ ]	transformation of energy	[ ]
sound energy	[ ]	sound	[ ]
pressure	[ ]	transmission of heat	[ ]
Others	[ ]	Please state:_____	

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR COOPERATION

TRANSKRIP TEMUDUGA

K : Pengkaji
P : Pelajar

PELAJAR 1

K: Tidak perlu beri nama sebab nama anda akan dirahsiakan. Kita akan berbincang sedikit tentang konsep sains bagi tema Pengasingan, Perlindungan dan Pencahayaan. Jadi, adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ada.
K: Apakah konsep sains yang anda gunakan?
P: Dalam perlindungan, aku menggunakan konsep elektrik.
K: Apa tema yang kamu pilih untuk Reka Cipta?
P: Perlindungan.
K: So, you use elektrik?
P: Yes.
K: Ok...selain dari itu, apa lagi konsep sains yang anda gunakan?
P: Mm....bunyi, arus elektrik.
K: Selain dari ini, ada lagi?
P: Tiada.
K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains dalam tema perlindungan yang kamu pakai?
P: Arus elektrik susah dipasang.
K: Oh, susah pasang the radas, is it?
P: Ah...ah (Nods his head).
K: Oh, OK...alright, Lagi?
P: Then...what I'm doing now is to lindung the ream.
K: To lindung the...?
P: Ream...ream kereta.
K: Oh...ream keretal Jadi...?
P: So I have a hard time...I have to think where the wire should be put. And then where the....electrik...I mean the board.
K: The board?
P: The board should hidden where?
K: Oh...you want to hide the board somewhere!
P: (Nods)
K: Either inside the car or some parts of the car, is it?
P: Ah...ah...(Nods)
K: OK, OK.
P: Then, how to pasang the litar. How to bunyikan alarm. Patut adakan alarm yang lain ataupun sambung ke hon kereta....So, I think these are the problems.
K: Apakah tindakan anda untuk mengatasi masalah yang anda sebutkan tadi?
P: I will go to do research....some research...or go to have....go to find a person who knows thislah.
K: Where do you do your research normally?
P: From...sometimes, ask my friends whether they've got the books about electricity or borrow from somebody....usually, it's (to) borrow from somebody.
K: Bagaimana...yang kamu kata akan minta pertolongan dari seorang yang tahu. Biasanya siapa orang itu yang kamu jumpa?
P: Kalau bolehlah. Kawan saya kenal semua radas...kegunaan radas, saya boleh minta tolong daripada dialah. Kalau saya tiada kawan sebegitu, saya akan pergi cari pekerja-pekerja untuk minta penerangan...dan untuk mendapat pengetahuan yang selanjutnya.
K: OK...pekerja-pekerja dari mana? Is it from the school or outside?
P: Outsiders.

K: Outsiders...That means...what kind of people?
P: Aa..who fix...who solves electric problems.
K: Oh, electricianlah.
P: Ya, electrician.
K: Juruteknik?
P: Ehem (Nods).
K: Selain dari tanya kawan, buat rujukan dan cari ini...nasihat daripada juruteknik, apa lagi cadangan anda untuk mengatasi masalah itu?
P: Mm...aah...we should overcome by school....we should have this pelajaran...I mean lebih lanjutlah...more specific.
K: Kamu cadang diadakan pelajaran. That means guru ajar?
P: Pengajaran daripada guru.
K: OK..apa aspek yang kamu mahu guru itu ajar?
P: Mm..about our problems. If this year we have 3 tema, Perlindungan, Pencahayaan and Pengasingan, then...teacher should ask us about the problems we're facing now...and then teacher should arrange...how to help to solve the problems...
K: Pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Ya
K: Kenapa?
P: Ia membolehkan kita membuat sesuatu dengan success..
K: Succesfully? Dengan berjayalah.
P: ah...(nods) berjaya.
K: Kalau tiada konsep sains, boleh....bagaimana?
P: Boleh tetapi projek yang dihasilkan tidak begitu menarik.
K: So, kamu perlukan konsep sains supaya bahan itu lebih menariklah. So, pada pendapat anda, adakah konsep sains perlu diajar di dalam kelas Reka Cipta?
P: Perlu.
K: Kenapa?
P: Supaya kita dapat...mengetahuinya dengan lebih lanjut...pengetahuan tentang konsep sains dengan lebih mendalam.
K: So that you can...pakailah? Mengaplikasikannya?
P: Dengan tidak menghadapi sebarang masalah.
K: That's good. Okay.

PELAJAR 2

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ada
K: Apakah konsep sains yang anda gunakan?
P: Aah...seperti proses fotosintesis.
K: Biologi, ya?
P: Ya
K: Lagi?
P: Lagi, tenaga elektrik. Aah...lebih kurang begitu...ah....ada haba lagi. Keterikan cahaya, saya mahu guna.
K: Ada lagi?
P: Tiada.
K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?
P: Susah nak jelaskan...Selain itu,...kadangkala konsep sains, perlu memahami dengan lebih mendalam lagi....Dan kadangkala susah bagi saya untuk menerangkan bagaimana projek berfungsi.
K: Fungsi projek itulah? Dari segi konsep sains lah.
P: Ya.
K: Jadi, bolehkah kamu terangkan konsep sains yang kamu gunakan itu? Senangkah, susah?
P: Sebenarnya agak senang juga.
K: Apakah tindakan anda untuk mengatasi masalah-masalah tadi?

P: Dengan minta bantuan daripada guru, rakan yang ada pengalaman punya.
K: Selain dari cara itu, apa lagi cara-cara?
P: Saya akan pergi ke...macam...kedai orang yang...tahu benda ini, saya tanya pengalaman mereka...dan tunjukajar daripada mereka.
K: Kedai aah?
P: Kedai yang tahu serba sedikit tentang alat itu.
K: Oh...kedai elektriklah?
P: Ya
K: Jadi, siapa yang membantu kamu kalau kamu pergi kedai?
P: dengan rakan saya yang ada ambil Reka Cipta lah.
K: Jadi, mereka kenal orang di kedai aah?
P: Tidak kenal juga tetapi kami tanya saja.
K: Selain dari kedai, ada pergi tempat lain?
P: Tidak juga.
K: Ada cadangan lain untuk mengatasi masalah sekiranya kawan-kawan lain menghadapi masalah?
P: Cuba tanya gurulah yang ada pengalaman punya.
K: Guru Reka Cipta? atau guru lain?
P: Guru Reka Cipta atau pembantu makmal begitu...mungkin ada guna bahan kimia...
K: Jadi, kamu tanya pembantu makmal jugalah selain dari guru?
P: Aah....Mm...(nods)
K: Pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Penting juga.
K: Kenapa?
P: Kerana banyak yang guna konsep sains untuk menerangkannya.
K: Kalau tiada konsep sains, bolehkah?
P: Boleh juga tapi...agak susah juga.
K: Jadi, perlukan konsep sainslah?
P: Ah....(nods)
K: OK, untuk menerangkan?
P: Bagaimana ia berfungsi...mm...dan kenapa boleh terjadi begitu.
K: OK, good.
P: Prosesnya.
K: Yes. Aah...pada pendapat anda, perlukah konsep sains diajar dalam kelas Reka Cipta?
P: Perlu jugalah
K: Kenapa?
P: Kerana kebanyakan projek memerlukan konsep sains. Mereka memerlukan dia punya asas...pengetahuan asas.
K: Pengetahuan asas sainslah...konsep sains...?
P: Baru boleh buat.
K: Baru boleh cipta, is it?
P: Mm....(nods)
K: OK...Thank you.

PELAJAR 3

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ya
K: Apakah konsep sains yang anda gunakan?
P: Ada tenaga elektrik, tenaga keupayaan dan juga tarikan graviti dan tekanan.
K: Selain dari itu, ada lagi tak?
P: Graviti.
K: Ada lagi?
P: (shakes his head)
K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?

P: Tidak begitu faham secara mendalam konsep itu.
K: Ada lagi masalah lain?
P: Tidak dapat menggunakannya dalam...projek yang hendak direkaciptakan.
K: Oh...jadi kamu tahu konsep itu tetapi tidak tahu menggunakannya dalam...
P: Aplikasinya juga.
K: Oh...aplikasinya dalam projek itulah?
P: Ya
K: OK, lagi?
P: ....(long pause). Juga...konsep sains yang sesuai susah didapatilah untuk projek itu.
K: Ada lagi?
P: (Shakes his head)
K: Apakah tindakan anda untuk mengatasi masalah-masalah tadi?
P: Boleh meminta bantuan daripada guru, rakan yang juga terlibat dalam reka ciptalah.
K: Apa lagi cara?
P: Boleh juga mencari maklumat daripada buku rujukan dan juga dari komputer melalui Internet.
K: Kamu guna Internet untuk cari rujukan?
P: Kadang-kadang
K: OK, buku rujukan alsolah?
P: Ya
K: Buku rujukan ini dari mana?
P: Perpustakaan.
K: Senang didapati?
P: Ya.
K: Selain dari itu, apa cadangan anda untuk mengatasi masalah?
P: Boleh mengadakan kelas sampingan.
K: Kelas sampingan untuk apa?
P: Mengajar konsep sains.
K: Oh,,,special untuk untuk ajar konsep sains saja, is it?
P: Ya
K: Lagi?
P: ....(long pause)...(shakes his head)
K: Tiada?
P: Ya
K: Tadi kamu kata adakan satu masa sampingan untuk ajar konsep sains...Jadi, adakah bermakna tidak cukup waktu untuk Reka Cipta?
P: Bukan tidak cukup...tetapi ada maklumat yang lebih banyak.
K: Oh...so that...
P: Kerana dalam...dalam sekolahkan, itu...kami belajar konsep itu saja....dalam teori juga. Kalau mahu gunakan konsep itu dalam reka cipta satu projek...yang perlu dicipta oleh orang lain, itu lebih susah.
K: So, you need a special class for thatlah? Aplikasilah?
P: (Nods)
K: Good cadangan. Now, pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Memanglah.
K: Kenapa?
P: Kerana ...dalam kehidupan kitalah...apa yang berlaku atau sedang berlaku, semuanya berkaitan dengan konsep sains. Kalau tiada konsep sains, kami memang tidak tahu apa sedang berlaku. Jadi, untuk merekacipta sesuatu, kita patutlah tahu konsep sains.
K: Good...pada pendapat anda, perlukah konsep sains diajar dalam kelas Reka Cipta?
P: Ya
K: Jadi, kalau kita tiada yang...kelas sampingan yang kamu cadangkan, dalam kelas reka cipta sahaja, perlukah ia diajar?
P: Kalau boleh, perlu juga.
K: Kenapa perlu diajar? Apa sebabnya?
P: Sudah jawab...(laughs)
K: (Laughs)...sudah jawab. Boleh ulang apa yang kamu jawab?

P: Kerana konsep sains penting dalam kehidupan kita. Apa yang berlaku juga bergantung kepada konsep sains. Boleh pelajari apa pun dari konsep sains.
K: Banyak yang boleh dipelajarilah...dari konsep sainslah?
P: Ya...(nods)
K: OK..good. Thank you.

PELAJAR 4

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ada
K: Apakah konsep sains yang anda gunakan?
P: Konsep sains yang saya gunakan ialah konsep penyejatan dan elektrik.
K: Ada lagi?
P: (Shakes his head)
K: Tiada. Hanya dua ini ya? Now, apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?
P: Masa untuk menentukan kadar penyejatan.
K: OK, lagi?
P: dan kuasa elektrik yang hendak digunakan.
K: Oh...berapa kuasa yang hendak digunakan?
P: (nods)
K: OK, apa lagi masalah lain?
P: Tiada
K: Apakah tindakan anda untuk mengatasi masalah-masalah tadi?
P: Menanyakan guru, berdasarkan rujukan.
K: Di mana kamu buat rujukan?
P: Mm...dalam buku.
K: Buku rujukan....daripada mana?
P: Perpustakaan ataupun buku yang kami gunalah
K: Buku apa tu? Bukut teks?
P: (nods) buku teks...Fizik dan rujukan
K: OK, ada cadangan lain untuk mengatasi masalah-masalah?
P: ....(long pause). Sendiri yang mencuba.
K: Sendiri cuba. That means....what?
P: Macam buat eksperimenlah.
K: oh...cubajaya. Cuba-cuba, is it?
P: Mm...(nods)
K: Pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Ya.
K: Kenapa?
P: Mm...dapat menentukan apa yang kita hendak buat.
K: Menentukan....buat. Lagi?
P: Mm...untuk menjayakan projek itu.
K: Kalau tiada konsep sains, bolehkah?
P: lebih susah.
K: OK...selain dari menjayakan projek?
P: ....(long pause). Mm...tiada.
K: OK, untuk menerangkan?
K: Pada pendapat anda, perlukah konsep sains diajar dalam kelas Reka Cipta?
P: Mm...perlu
K: Kenapa?
P: Mm..supaya kita mempunyai lebih banyak konsep yang boleh digunakan dalam projek reka cipta kami.
K: Jadi, bermakna sekarang konsep yang kamu tahu cukup atau tidak?
P: Tidak berapa cukup.
K: Jadi, kamu berharap diajarlah?
P: Ya
K: OK...Terima kasih.

PELAJAR 5

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ya
K: Apakah konsep sains yang anda gunakan?
P: Mm.....yang berkaitan dengan elektrik punya.
K: Ada lagi konsep lain?
P: Sehingga kini masih belum ada.
K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?
P: Kadang-kadang tidak dapat menggunakannya dengan.....Mm....tidak tahu bagaimana menggunakannya....dalam sesuatu bahagian.
K: Tidak tahu bagaimana menggunakan konsep sains itu.....
P: Di setengah-setengah bahagian.
K: Oh....di setengah-setengah bahagian. OK, ada lagi masalah lain?
P: Tak ada lagi.
K: Tak ada. Jadi, apakah cadangan anda untuk mengatasi masalah tersebut?
P: Mm...mengajar konsep sains di Reka Cipta....mata pelajaran Reka Cipta.
K: Jadi, kamu mahu siapa mengajar?
P: Aah...guru Reka Cipta.
K: Lagi...selain dari cadangan itu?
P: Mm....(long pause)....sendiri membuat...di kelas, membuat eksperimen dengan menggunakan konsep itu untuk memahami dengan lebih teliti lagi.
K: OK...lagi? Cadangan lain?
P: .....Tak ada.
K: Jadi kamu cadangkan bahawa konsep sains perlu diajar di dalam kelas itulah. Jadi, pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Bergantung kepada projek yang kamu buat.
K: Contohnya?
P: Contohnya jikalau kamu buat projek yang....macam berkaitan dengan tenaga elektrik, kamu perlu memahami keabadian tenaga elektrik. Banyak lagilah.
K: Jadi, kalau tiada konsep sains, boleh merekaciptakah?
P: Boleh juga, bergantunglah. Kalau dia...ikut yang....macam membuat...mungkin dia....projek itu berkaitan dengan tumbuhan.
K: Mm...so, dalam tema perlindungan, pengasingan, pencahayaan, adakah konsep sains penting?
P: Boleh dikatakan.
K: Jadi, kamu rasa ia perlulah untuk merekaciptalah...atau tidak perlu?
P: Perlu juga.
K: Sebabnya?
P: Menolong kamu memahaminya dengan lebih teliti lagi....memudahkan lagi.
K: Oh, memahami dan memudahkan....memudahkan apa?
P: Macam kamu fikir sesuatu yang kamu mahu selesaikan, mungkin kamu boleh cari balik buku, tengok itu konsep-konsep dan memberi idea bagaimana menyelesaikannya.
K: Mm...mm. OK. Thank you.

PELAJAR 6

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ya
K: Apakah konsep sains yang anda gunakan?
P: Elektrik.

K: Lagi?
P: Tiada.....
K: Tiada lagi? Apa konsep lain yang anda gunakan?
P: Bunyi.
K: Lagi?
P: Tenaga kimia dan arus elektrik.
K: Ada lagi yang lain?
P: Tiada.
K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?
P: Susah untuk mengaplikasi.
K: Susah untuk aplikasikan apa? Konsep itu?
P: Ya.
K: Di mana?
P: Di...projek itu.
K: OK, selain dari masalah itu, apa masalah lain yang anda hadapi?
P: .....(Silence).....(Shakes his head).....Tiada.
K: OK, now, apakah cadangan anda untuk mengatasi masalah tersebut?
P: ...(Silence)... konsep-konsep itu diajar di dalam kelas.
K: Adakah ia diajar sekarang?
P: Sikit saja.
K: OK..., apa lagi cadangan lain?
P: (Silence)
K: Apabila anda menghadapi masalah, apa yang anda buat?
P: Meminta bantuan daripada cikgu atau kawan.
K: Selain dari cikgu atau kawan?
P: Tiada lagi.
K: Jadi, pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Ya.
K: Kalau tiada konsep sains, boleh merekacipta atau tidak?
P: .....(Silence)...Mungkin tidak.
K: Bagi tema tema perlindungan, pengasingan, pencahayaan, jadi kamu rasa konsep sains penting?
P: Ya.
K: Jadi, adakah konsep sains perlu diajar di dalam kelas Reka Cipta?
P: Ya.
K: Apa kepentingannya?
P: Menolong memahami...lebih dalam lagi.
K: Tentang?
P: konsep-konsep sains.
K: Konsep itu. OK...ada lagi?
P: (Shakes his head).
K: Tiada. OK. Thank you.

PELAJAR 7

K: Adakah anda menggunakan konsep sains dalam kelas Reka Cipta?
P: Ya
K: Apakah konsep sains yang anda gunakan?
P: Sistem takal.
K: Lagi?
P: Di samping....ada tarikan graviti dan juga...tenaga keupayaan.
K: OK, lagi?
P: Tenaga kinetik.
K: Lagi?
P: Tiada.

K: Apakah masalah-masalah yang anda hadapi berkenaan dengan penggunaan konsep sains?
P: ....(Silence)...Susah untuk menggunakannya di dalam Reka Cipta.
K: Susah untuk menggunakan konsep itu?
P: Ya.
K: Dalam?
P: Projek.
K: OK, apa masalah lain yang anda hadapi?
P: Tidak begitu memahami konsep sains.
K: Jadi, kalau anda tak faham konsep sains, adakah anda menggunakan konsep itu?
P: Ada...dengan tunjukajar dari guru dan rakan-rakan.
K: Jadi itu tindakan anda untuk mengatasi masalah?
P: Ya.
K: Ada cadangan lain untuk mengatasi masalah-masalah?
P: ...(Silence)... dapat diajar dengan lebih mendalam mengenai konsep sains.
K: Kamu mahu siapa ajar?
P: Guru.
K: Guru...dalam mana? di kelas?
P: Di dalam kelas.
K: OK..., apa lagi cadangan lain untuk atasi masalah itu?
P: (Shakes his head)
K: Tiada lagi...OK...Jadi, pada pendapat anda, adakah konsep sains penting untuk Reka Cipta?
P: Ya.
K: Kenapa?
P: Aah....lebih senang untuk membuat projek.
K: Kalau tiada konsep sains, tak boleh buatkah?
P: Boleh. Tetapi projek itu tidak begitu baik dan tidak berfungsi dengan baik.
K: Selain dari itu, kenapa konsep sains penting?
P: (Silence)
K: Ada lagi?
P: (Shakes his head)
K: Tiada. OK, jadi, adakah konsep sains perlu diajar di dalam kelas Reka Cipta?
P: Ya.
K: Sekarang, ada tak diajar?
P: Ada, tapi bukan dalam Reka Cipta. Mata pelajaran sains yang lain.
K: Oh...mata pelajaran sains yang lain. Jadi, dalam kelas Reka Cipta?
P: Tiada.
K: OK, Jadi, kamu rasa ia perlu diajarlah?
P: Ya.
K: OK...Terima kasih.

INTERVIEW TRANSCRIPT

K : Researcher
P : Student

STUDENT 1

K: There's no need to give your name as it will be confidential. We shall be discussing a little about science concepts for the themes Separation, Protection and Lighting. So, do you use any science concept in your Reka Cipta class?
P: Yes.
K: What science concepts do you use?
P: In Protection, I use electricity.
K: What is the theme that you've chosen for your Reka Cipta project?
P: Protection.
K: So, you use electric?
P: Yes.
K: OK...other than that, what other science concepts do you use?
P: Mm....sound, electric current.
K: Other than that, is there any more?
P: No.
K: What are the problems that you face with regards to the application of science concepts in the theme Protection that you've chosen?
P: Electric current is difficult to fix.
K: Oh, difficult to fix the circuit, is it?
P: Ah...ah (Nods his head).
K: Oh, OK...alright, Any more?
P: Then...what I'm doing now is to protect the ream.
K: To protect the...?
P: Ream...car ream.
K: Oh...car ream! So...?
P: So I have a hard time...I have to think where the wire should be put. And then where the....electric...I mean the board.
K: The board?
P: The board should hidden where?
K: Oh...you want to hide the board somewhere!
P: (Nods)
K: Either inside the car or some parts of the car, is it?
P: Ah...ah...(Nods)
K: OK, OK.
P: Then, how to fix the circuit. How to sound the alarm. Should I use another alarm or just connect to the car honk....So, I think these are the problems.
K: What are you actions in order to overcome the problems that you mentioned just now?
P: I will go to do research....some research...or go to have....go to find a person who knows this.
K: Where do you do your research normally?
P: From...sometimes, ask my friends whether they've got the books about electricity or borrow from somebody....usually, it's (to) borrow from somebody.
K: How...you said you'd ask help from someone who knows. Normally, who is the person that you see?
P: If possible. My friend knows all the apparatus...the use of the apparatus, I can ask him to help. If I can't find such a friend, I'd go and look for workers to obtain their explanation...and to gain further knowledge.
K: OK...workers from where? Is it from the school or outside?
P: Outsiders.

K: Outsiders...That means...what kind of people?
P: Aa..who fix...who solves electric problems.
K: Oh, electrician.
P: Yes, electrician.
K: Technician?
P: Ehem (Nods).
K: Other than asking your friends, refer to books and look for this...advice from a technician, what other recommendation do you have for overcoming the problems?
P: Mm...aah...we should overcome by school....we should have this lesson...I mean in detail...more specific.
K: You suggest having lessons. That means the teacher teaches?
P: Instruction from the teacher.
K: OK..what aspect do you want the teacher to teach?
P: Mm..about our problems. If this year we have 3 themes, Protection. Lighting and Separation, then...teacher should ask us about the problems we're facing now...and then teacher should arrange...how to help to solve the problems...
K: In your opinion, are science concepts important for Reka Cipta?
P: Yes.
K: Why?
P: They enable us to do something with success..
K: Successfully?
P: ah...(nods) successfully.
K: If there is no science concept, can we....how?
P: We can but the project that we produce will not be that interesting.
K: So, you need science concepts so that the product would be more interesting. So, in your opinion, should science concepts be taught in the Reka Cipta class?
P: Yes.
K: Why?
P: So that we can get...know in detail...knowledge about science concepts in depth.
K: So that you can...use? Apply them?
P: Without any difficulty.
K: That's good. Okay.

STUDENT 2

K: Do you use any science concept in the Reka Cipta class?
P: I do.
K: What science concepts do you use?
P: Aah...such as photosynthesis process.
K: Biology?
P: Yes
K: Any more?
P: electricity. Aah...almost like that...ah....there's also heat. Amount of light, I want to use.
K: Any more?
P: No.
K: What are the problems that you face with regards to the application of science concepts?
P: Difficult to explain...Other than that,...sometimes the science concepts, need to understand in depth....And sometimes difficult for me to explain how a project functions.
K: Function of the project? From the aspect of science concepts.
P: Yes.
K: So, are you able to explain the science concepts that you use? Easy or difficult?
P: Actually, quite easy.
K: What are the actions that you would take to solve the problems that you mentioned just now?
P: Ask help from the teacher, friends who are have the experience.
K: Other than that, what other ways?

I'd go to...like...shops of people who...know such things, I'd ask for their experience...and guidance from them.
Shop?
Shop that knows about the equipment.
Oh... electrical shop?
Yes
So, who helps you if you go the shop?
with friends who take Reka Cipta.
So, they know the people in the shop?
Not really but we'll just ask.
Other than shops, do you go to other places?
Not really.
What are your suggestion for overcoming the problems if other friends of yours face problems?
Try asking teachers who have the experience.
Reka Cipta teachers? or other teachers?
Reka Cipta teachers or lab assistants...maybe chemicals are used...
So, you ask lab assistants as well as teachers?
Aah....Mm...(nods)
In your opinion, are science concepts important for Reka Cipta projects?
Quite important.
Why?
Because many (projects) need science to explain them.
If there is no science concept, it is possible?
Possible but...quite difficult.
So, science concepts are needed?
Ah....(nods)
OK, to explain them?
How it functions...mm...and why it happens that way.
OK, good.
Its process.
Yes. Aah...in your opinion, should science concepts be taught in the Reka Cipta class?
Should
Why?
Because most projects need science concepts. They need the foundation...knowledge foundation.
Science knowledge foundation...science concept...?
Only then we can make it.
Only then we can invent, is it?
Mm....(nods)
OK...Thank you.

STUDENT 3

K: Do you use science concepts in your Reka Cipta class?
P: Yes
K: What science concepts do you use?
P: There's electricity, potential energy and also gravitational pull and pressure.
K: Other than that, are there any more?
P: Gravity.
K: Any more?
P: (shakes his head)
K: What are the problems that you face with regards to application of science concepts?
P: Don't really understand the concept in depth.
K: Is there any other problem?
P: Can't use them in...project that is to be invented.
K: Oh...so you know the concepts but do not know how to use them in...

P: The applications as well.
K: Oh...applications in the project?
P: Yes
K: OK, any more?
P: ....(long pause). Also...suitable science concepts for the project are difficult to obtain.
K: Any more?
P: (Shakes his head)
K: What are the actions that you would take to overcome the problems?
P: Can ask help from the teacher, friends who are also involved in Reka Cipta.
K: What other ways?
P: Can also look for information from reference books and also from the computer through the Internet.
K: You use the Internet for reference?
P: Sometimes
K: OK, reference books also?
P: Yes
K: Where are these reference books from?
P: Library.
K: Easy to obtain?
P: Yes
K: Other than that, what are your suggestions in order to overcome the problems?
P: Can have extra class.
K: Extra class for what?
P: To teach science concepts.
K: Oh...specially to teach science concepts only, is it?
P: Yes
K: Any more?
P: ....(long pause)...(shakes his head)
K: None?
P: Yes
K: Just now you mentioned having an extra period to teach science concepts...so, does that mean that there's not enough time for Reka Cipta?
P: Not that...but there should be more information.
K: Oh...so that...
P: Because in...in school...we only learn the science concepts....in theory. If want to use the concepts in the invention of a project...one that is invented by someone, it's more difficult.
K: So, you need a special class for that? Application?
P: (Nods)
K: Good suggestion. Now, in your opinion, are science concepts important for Reka Cipta?
P: Of course.
K: Why?
P: Because...in our daily lives...whatever's happened or is happening, all are connected to science concepts. If there is no science concept, we would not know what's happening. So, to invent something, we should know science concepts.
K: Good...in your opinion, should science concepts be taught in the Reka Cipta class?
P: Yes
K: So, if we do not have...an extra class as you've suggested, in the Reka Cipta class only, should they be taught?
P: If possible, yes.
K: Why should they be taught? What are the reasons?
P: Already answered...(laughs)
K: (Laughs)...already answered. Can you repeat what you've answered?
P: Because science concepts are important in our daily lives. Whatever's happening also depends on science concepts. Can learn whatever from science concepts.
K: A lot can be learnt ...from science concepts?
P: Yes...(nods)
K: OK..good. Thank you.

STUDENT 4

K: Do you use science concepts in your Reka Cipta class?
P: I do
K: What science concepts do you use?
P: The science concepts that I use are evaporation and electricity.
K: Any more?
P: (Shakes his head)
K: No. Only these two? Now, what are the problems that you face with regards to application of science concepts?
P: The time for determining the evaporation rate.
K: OK, any more?
P: and the electric power to be used.
K: Oh...how much power to use?
P: (nods)
K: OK, what other problems?
P: None
K: What are the actions that you take to overcome the problems?
P: Ask the teacher, based on reference.
K: Where do you do your reference?
P: Mm...in books.
K: Reference books....from where?
P: Library or the books that we use.
K: What books are those? Text books?
P: (nods) text books...Physics and reference
K: OK, What other suggestions are there to overcome the problems?
P: ....(long pause). Try ourselves.
K: Try ourselves. That means....what?
P: Like doing experiment.
K: oh...trial and error. Try an error, is it?
P: Mm...(nods)
K: In your opinion, are science concepts important for Reka Cipta?
P: Yes
K: Why?
P: Mm...can determine what we want to make.
K: Determine....make. What else?
P: Mm...to make the project succeed.
K: If there's no science concepts, can we do it?
P: more difficult.
K: OK...other than making the project succeed?
P: ....(long pause). Mm...none.
K: In your opinion, should science concepts be taught in Reka Cipta class?
P: Mm...yes
K: Why?
P: Mm...so that we have more concepts that can be used in our invention projects.
K: So, does this means the science concepts that you know now, are they sufficient?
P: Not really sufficient.
K: So, you wish that they be taught?
P: Yes
K: OK...Thank you.

STUDENT 5

K: Do you use science concepts in your Reka Cipta class?
P: Yes
K: What science concepts do you use?
P: Mm.....those connected to electricity.

K: Are there any other concepts?
P: Until now, not yet.
K: What problems do you face with regards to application of science concepts?
P: Sometimes cannot use them with.....Mm....don't know how to use them....in certain part.
K: Do not know how to use the science concepts.....
P: In certain parts.
K: Oh....in certain parts. OK, are there any other problems?
P: No more.
K: No more. So, what are your suggestions to overcome the problems?
P: Mm...teaching science concepts in Reka Cipta....Reka Cipta lessons.
K: So, who is supposed to teach?
P: Aah...Reka Cipta teacher.
K: What else...other than that suggestion?
P: Mm....(long pause)....make ourselves...in class, do experiments using the concept to understand in detail.
K: OK...what else? Other suggestion?
P: .....None.
K: So you suggest that science concepts be taught in the class itself. So, in your opinion, are science concepts important for Reka Cipta?
P: Depending on the project that you make.
K: For instance?
P: For instance if you make a project which....like connected to electricity, you have to understand electricity conservation. A lot more.
K: So, if there's no science concept, can we invent?
P: Possible, depends. If he...follow....like making...maybe he....the project is connected to plants.
K: Mm...so, in the themes Protection, Separation, Lighting, are science concepts important?
P: Can say so.
K: So, you feel they're needed for invention...or not needed?
P: Needed.
K: The reasons?
P: Help you to understand in more detailed....make it easier.
K: Oh, understand and make it easier....make it easier for what?
P: If you think of something that you would like to solve, maybe you can look for through some books, look for the concepts and give idea how to solve it.
K: Mm...mm. OK. Thank you.

STUDENT 6

K: Do you use science concepts in your Reka Cipta class?
P: Yes
K: What science concepts do you use?
P: Electricity.
K: What else?
P: None.....
K: No more? What other concepts that you use?
P: Sound.
K: Any more?
P: Chemical energy and electric current.
K: Any others?
P: None.
K: What problems do you face with regards to application of science concepts?
P: Difficult to apply.
K: Difficult to apply what? The concepts?
P: Yes

K: Where?
P: In...the project.
K: OK, other than that problem, what other problem do you face?
P: .....(Silence).....(Shakes his head).....None.
K: OK, now, what are your suggestions for overcoming the problems?
P: ...(Silence)... the concepts be taught in class.
K: Are they taught now?
P: A little only.
K: OK..., what other suggestions?
P: (Silence)
K: When you face problems, what do you do?
P: Ask for assistance from teacher or friends.
K: Other than teacher or friends?
P: No more.
K: So, in your opinion, are science concepts important for Reka Cipta?
P: Yes
K: If there's no science concept, can we invent?
P: .....(Silence)...Maybe not.
K: For the themes protection, separation, lighting, so you feel that science concepts are important?
P: Yes
K: So, should science concepts be taught in Reka Cipta class?
P: Yes
K: What are the importance?
P: Help to understand...in more depth.
K: About?
P: Science concepts.
K: The concepts. OK...what else?
P: (Shakes his head).
K: None. OK. Thank you.

STUDENT 7

K: Do you use any science concept in your Reka Cipta class?
P: Yes
K: What science concepts do you use?
P: Pulley system.
K: Any more?
P: Besides that....there's gravitational pull...potential energy.
K: OK, any more?
P: Kinetic energy.
K: What else?
P: None.
K: What are the problems that you face with regards to application of science concepts?
P: ....(Silence)...Difficult to use them in Reka Cipta.
K: Difficult to use the concepts?
P: Yes
K: In?
P: The project.
K: OK, what other problems do you face?
P: Don't really understand science concepts.
K: So, if you don't understand the science concepts, do you use them?
P: I do...with guidance from teacher and friends.
K: So that's the action you take to overcome the problems?
P: Yes
K: Are there other suggestions for overcoming the problems?
P: ...(Silence)...science concepts can be taught in more depth.

K: Who should teach?
P: Teacher
K: Teacher...in where? in class?
P: In the class.
K: OK..., what other suggestions are there to overcome the problems?
P: (Shakes his head)
K: No more...OK...So, in your opinion, are science concepts important for Reka Cipta?
P: Yes
K: Why?
P: Aah....easier to make a project.
K: If there's no science concept, can't we make it?
P: Can. But the project will not be that good and it won't function well.
K: Other than that, why are science concepts important?
P: (Silence)
K: Any more?
P: (Shakes his head)
K: None. OK, so, should science concepts be taught in the Reka Cipta class?
P: Yes
K: Now, are they taught?
P: They are, but not in Reka Cipta. Other science subjects.
K: Oh...other science subjects. So, in Reka Cipta class?
P: None.
K: OK, So, you think they should be taught?
P: Yes
K: OK...Thank you.