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LEERA
Lithuanian Educational
Research Association

Inquiry-based learning (IBL) projects' implementation report

The Circular Economy



Aizkraukles novada vidusskola



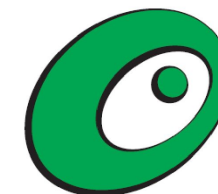
VILKAVIŠKIO RAJ. PILVIŠKIŲ
„SANTAKOS“
GIMNAZIJA



VILNIAUS VYTAUTO DIDŽIOJO
GIMNAZIJA



ŠALČININKŲ RAJ. EIŠIŠKIŲ
STANISLOVO RAPOLIONIO
GIMNAZIJA



SOCIAL
LEADERSHIP
ASSOCIATION

Part I. IBL projects' metadata

1. IBL project theme //Circular Economy
2. Teacher's Name Surname, School // Zane Sirmace- Liedskalniņa, Aizkraukles novada vidusskola (Aizkraukle regional secondary school)
3. IBL integrated subjects (domain) // Social sciences (economy)
4. IBL project's goal // to make the IBL project in one of four the interested themes: food and waste, textile and waste, waste as resources or the Circular Economy business models
5. Kind of inquiry method(s) // content analysis, surveys, interview.
6. IBL project common duration // 6 weeks
7. Form of education – formal, non-formal // formal
8. Participated class(es), number of students // Form 11A & 11B, 40 students
9. What number of social risk, special needs, gifted students participated?? // 4 students of social risk (used not to attend school because of health or seclusion), 6 students can have problems with latvian language (bilingual program in elementary school)



*Teachers & Researchers Networking for
Inquiry-based learning*

Projects «The Circular Economy»

Form 11

Aizkraukles regional secondary school

Zane Sirmace- Liedskalniņa

Part II. IBL projects' description/ EN

The IBL projects of Circular Economy implementation

Form 11A - 21 students;

Form 11B - 19 students,

Themes of the 9 projects:

1. *Food and waste* - 3 projects
2. *Textil and waste* - 2 projects
3. *Waste as resources* - 2 projects
4. *The Circular Economy business models* - 2 projects

29 research questions about textiles, food, waste, business models

Dissemination for teachers international community:

The Inquiry Learning Space (ILS) developed in Graasp.eu;

published on the Go-Lab ecosystem: <https://www.golabz.eu/ils/aprites-ekonomika>

Part II. IBL projects' description/ EN

The Circular Economy projects' timeline. Activities according to the IBL project phases

Week 1 – Orientation

Week 2 – Orientation

Week 3 – Conceptualization, Investigation

Week 4 – Investigation

Week 5 – Investigation, Conclusion

Week 6 – Conclusion

Digital tools:

Word, Powerpoint, menti.com, canva.com, GoogleForms, Excel,

Instagram

The Circular Economy

Aizkraukle regional secondary school, Form 11A, 11B

<p>E.g. weeks or topic Week 1 40 min.</p>	<p>Acquisition ⌚ : 15 min Teacher presentation about inquiry-based learning and the main topic – The circular Economy Tools: Presentation</p>	<p>Collaboration ⌚ : 15 min Students formulate issues about the circular economy Tools: small paper for each group</p>	<p>Discussion ⌚ : 10 min All groups present their issues and discuss the best. Teacher collect all issues</p>	<p>Orientation</p>				
<p>E.g. weeks or topic Week 2 120 min.</p>	<p>Acquisition ⌚ : 10 min Teacher presentation about business models of the Circular Economy Tools: Presentation</p>	<p>Investigation ⌚ : 50 min Students in small groups find examples of companies for 5 business models Tools: phone with internet connection, information about the models description in the board</p>	<p>Collaboration ⌚ : 20 min Groups name their examples, justify their relevance. Write the name of the company on the board Tools: white board, marker</p>				<p>Acquisition ⌚ : 10 min Introduction about the business canvas and the task Tools: Presentation, business canvas frame for the group</p>	<p>Practice ⌚ : 30 min The same groups fill the business canvas for one of the circular economy company, teacher evaluates Tools: business canvas frame for the group</p>
<p>E.g. weeks or topic Week 3 120 min</p>	<p>Acquisition ⌚ : 10 min Introduction of activities, voting for the direction of interest interesting Tools: presentation, menti.com, phones</p>	<p>Collaboration ⌚ : 30 min Students divides into interest groups, sort the research questions, choose the best for the group, present it to the class Tools: copies of questions for every group</p>	<p>Acquisition ⌚ : 5 min Introduction of the lesson activities Tools: Presentation, phones, links to the resources</p>	<p>Discussion ⌚ : 15 min Students work in the groups, discuss, set work tasks Tools: paper, pen, computers</p>	<p>Acquisition ⌚ : 20 min Read documents, watch videos Tools: Computers, list of the resources, phones</p>	<p>Acquisition ⌚ : 15 min Presentation about preparation of surveys and interviews Tools: computer</p>	<p>Production ⌚ : 25 min Students create questions for surveys, send to classmates for a test Tools: computers</p>	<p>Conceptualization Investigation</p>
<p>E.g. weeks or topic Week 4-6 280 min</p>	<p>Acquisition ⌚ : 5 min Introduction of the lesson activities Tools: Presentation,</p>	<p>Investigation ⌚ : 35 min Analyze the information, collect data through Google Forms, surveys, interviews, Tools: google Forms, Excel</p>	<p>Discussion ⌚ : 20 min Students articulate their ideas about research work, evaluate their progress, control the tasks Tools: computers, powerpoint, Canva</p>	<p>Collaboration ⌚ : 20 min Continue work on their tasks Tools: computers, powerpoint, Canva</p>	<p>Production ⌚ : 120 min Homework in the groups for preparing the final work Tools: WhatsApp, Canva, online presentations, check-list</p>	<p>Production ⌚ : 40 min Students make conclusions, presentation and the final product- brochure, or Infogram, blog Tools: computer, Check-list</p>	<p>Practice ⌚ : 40 min Students present their project, evaluate their activities in the project and argue it, teacher evaluate students presentations Tools: computer, presentations, work sheet</p>	<p>Investigation Conclusion</p>

Legen

Synchrone	No synchrone	Formative evaluation	Self evaluation/ Reflection	

The template for ABC LD use in schools adapted by



Inquiry-based learning activity FOR STUDENTS

Step 1 : .Get acquainted with the basic questions (Orientation)

Acquisition ⌚ : 15 min

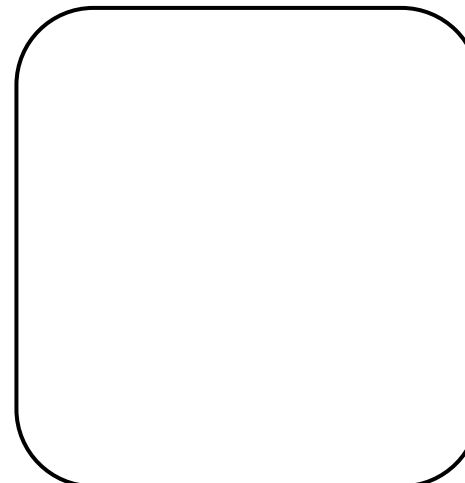
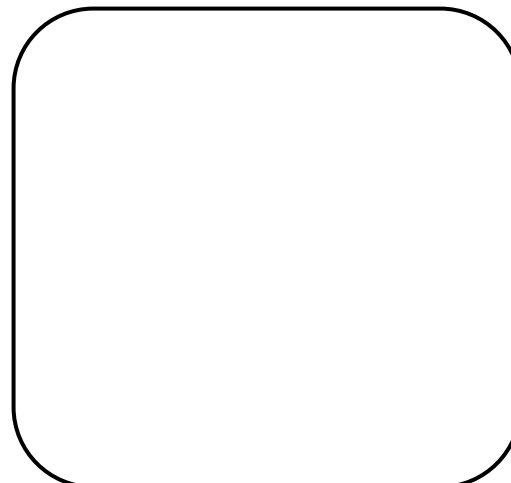
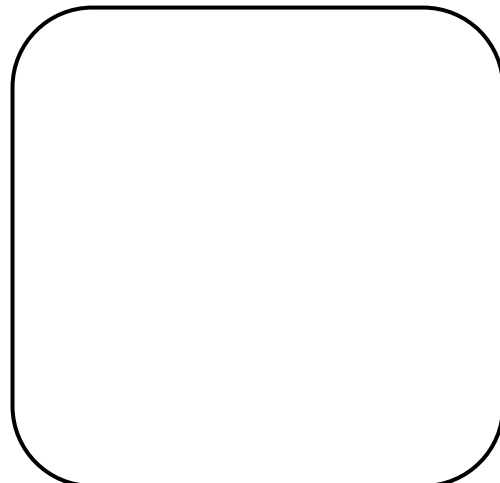
To listen presentation about inquiry-based learning and the main topic – The circular Economy. Watch 2 minutes video, answer the questions about video.

Collaboration ⌚ : 15 min

Students formulate issues about the circular economy (small groups)

Discussion ⌚ : 10 min

All groups present their issues and discuss the best, give to a teacher all the group issues



Acquisition ⌚ : ... min

Practice ⌚ : ... min

Production ⌚ : ... min

Collaboration ⌚ : ... min

Investigation ⌚ : ... min

Discussion ⌚ : ... min





Students divided into 9 project groups by voting in Menti.com
Each group choosed one research question



Inquiry-based learning activity FOR STUDENTS

Step 2 : Understanding of five business models in the Circular Economy (Orientation)

Acquisition : 10 min

To listen presentation about five business models of the Circular Economy, fix the main idea about each model.

Investigation : 50 min

Students in small groups find examples of companies for 5 business models on their phones

Collaboration : 20 min

Groups name their examples, justify their relevance. Write the name of the company on the board

Acquisition : 10 min

To listen the introduction about the business canvas and the task

Practice : 30 min

The same groups fill the business canvas for one of the circular economy company, get formative evaluation from the teacher

Acquisition : ... min

Practice : ... min

Production : ... min

Collaboration : ... min

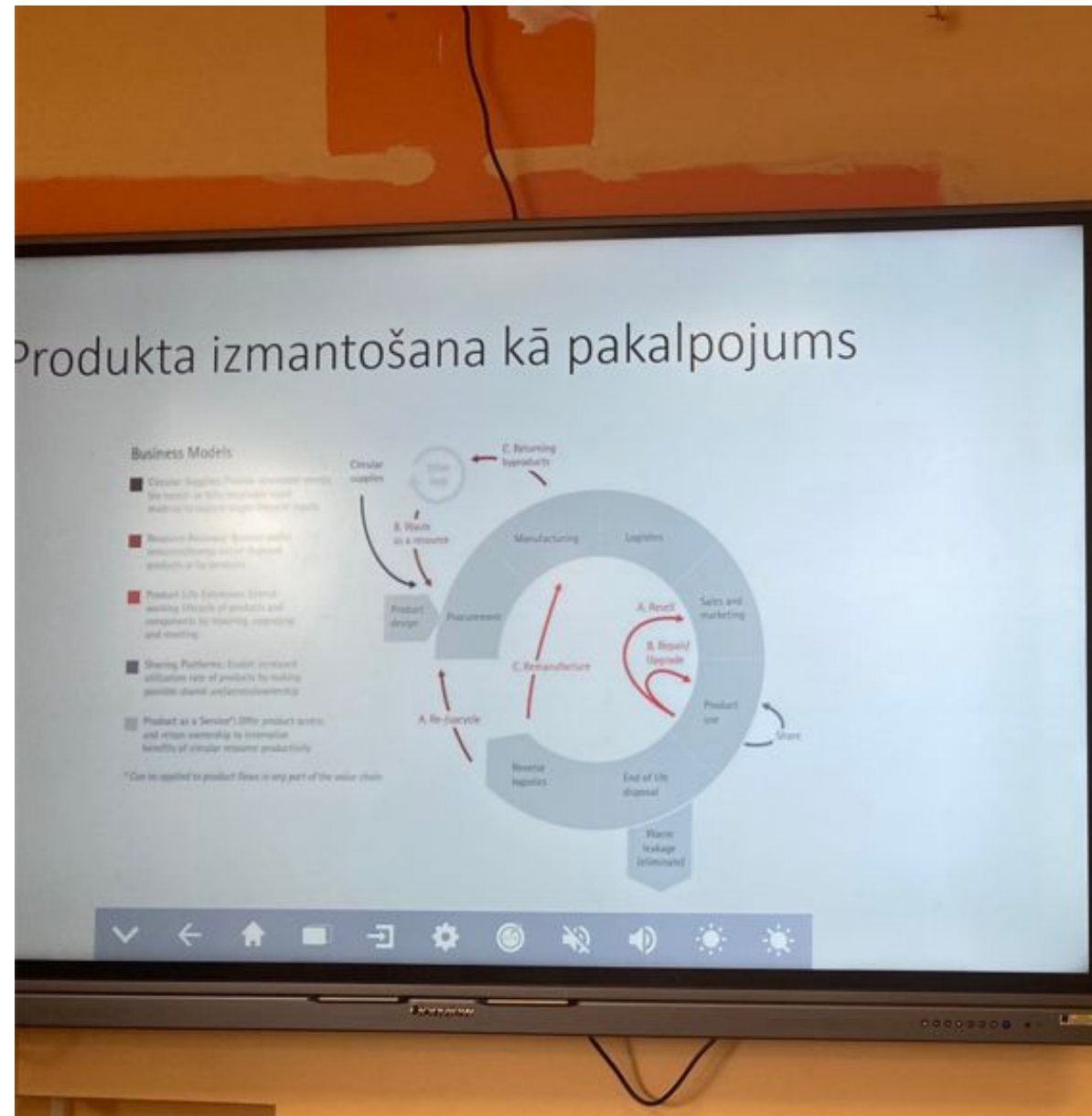
Investigation : ... min

Discussion : ... min



IBL phase 2:

Understanding of five business models in the Circular Economy (Orientation)



① Bioventa "de-grain" Agro Jecavs

① Bioventa "de-grain" Agro Jecavs

② Depant-Systema H&M Rigantes Kofeeco
ADVEN AKZ

③ IKEA, GETTA PRO, RAMSIGA,
ALBATROSS, VOLGA VINTIGE ASUVI

④ Car guru CityBee Bolt Baltcom
Brūvode

⑤ Dormeo Renti, w Signifity
Dollar Shave Club

Inquiry-based learning activity FOR STUDENTS

Step 3 : Choosing the research question, setting work tasks (conceptualization, investigation)

Acquisition : 10 min

Introduction of activities, voting for the direction of interest interesting .

Collaboration : 30 min

Students divides into interest groups, sort the research questions, choose the best for the group, present it to the class

Acquisition : 5 min

Introduction of the lesson activities

Discussion : 15 min

Students work in the groups, discuss, set work tasks for all together and individual

Acquisition : 20min

Read documents, watch videos related to their topic

Acquisition : 15 min

Listen to a presentation about preparation of surveys and interviews

Production : 25min

Students create questions for surveys, send to classmates for a test

Acquisition : ... min

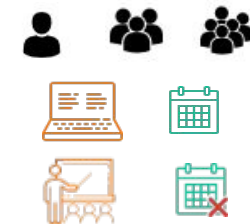
Practice : ... min

Production : ... min

Collaboration : ... min

Investigation : ... min

Discussion : ... min

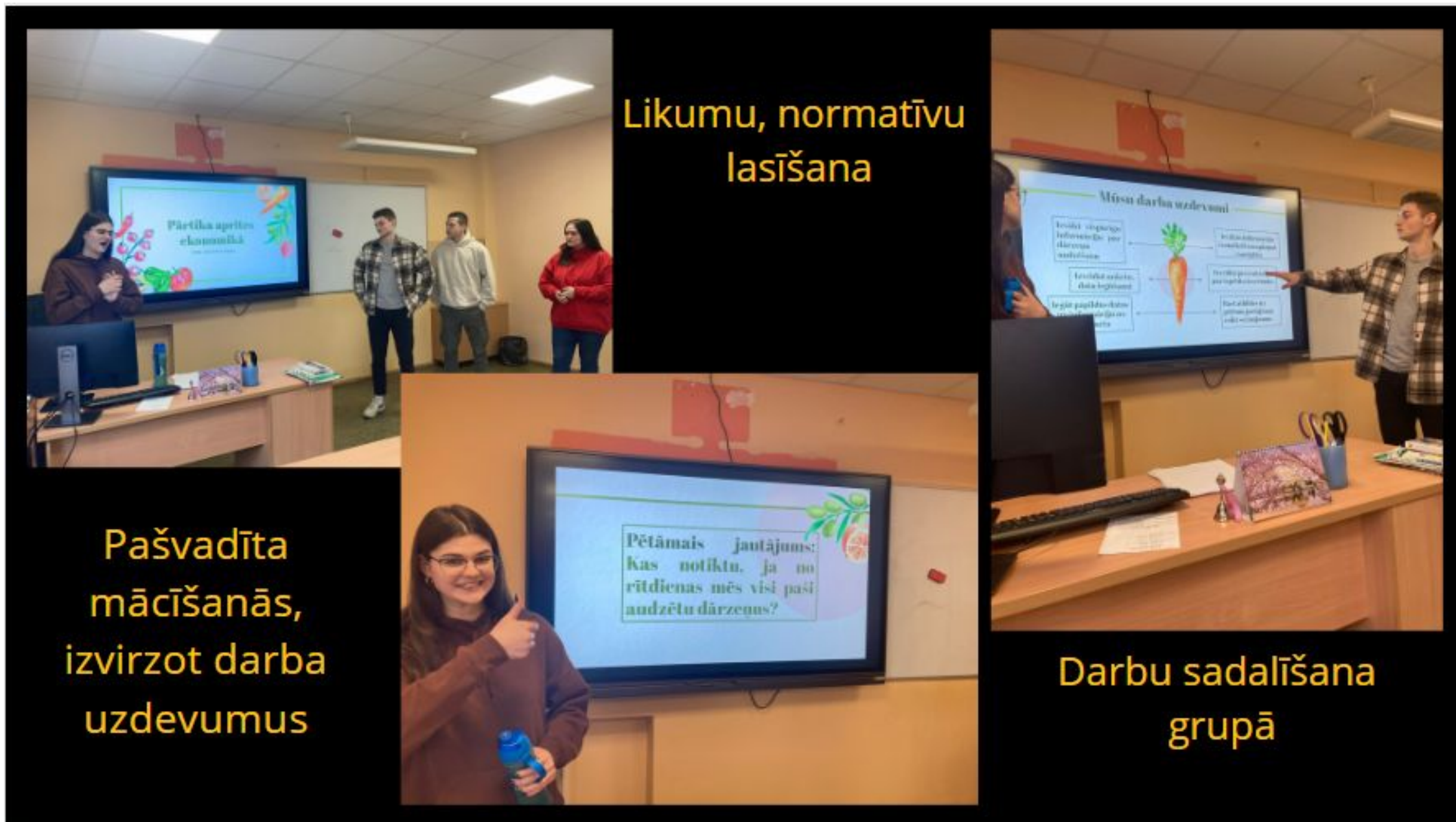


IBL phase 3 :

Choosing the research question, setting work tasks (conceptualization, investigation)

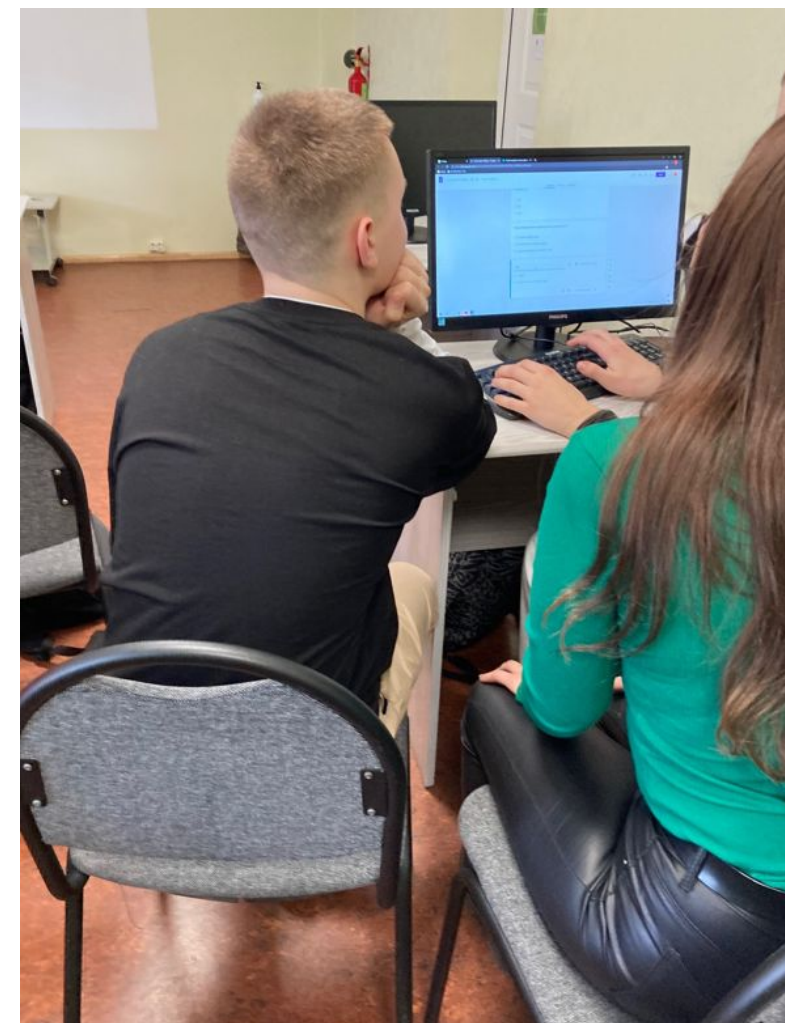
Self-directed learning by setting work tasks

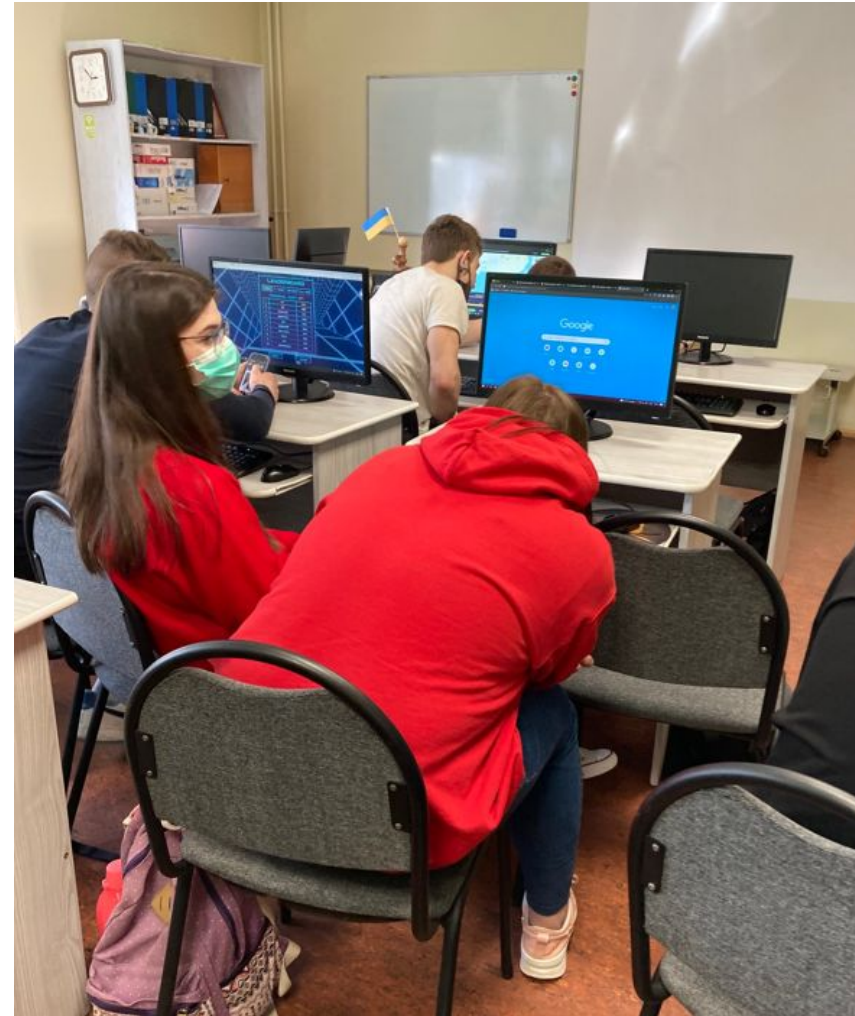
Division of work into a group




Law, normative reading

- Vides aizsardzības un reģionālās attīstības ministrija (VARAM): <https://www.varam.gov.lv/lv>
- “Aprites ekonomikas stratēģija Latvijai”
https://www.varam.gov.lv/sites/varam/files/content/files/varamzin_200120_aestrategija.pdf
- Atkritumu apsaimniekošanas plāns Latvijā līdz 2028.gadam:
https://www.varam.gov.lv/lv/atkritumu-apsaimniekosanas-politika-latvija?utm_source=https%3A%2F%2Fwww.google.com%2F
- Atkritumu apsaimniekošanas poligoni LV:
https://www.varam.gov.lv/sites/varam/files/content/files/atkritumu_poligoni_lv_karte.pdf
- Vides investīciju fonds: <http://www.lvif.gov.lv/>
- Zaļgalvis- raidījums par vidi: <https://ltv.lsm.lv/lv/raidijums/zaļgalvis>
- <https://www.zerowastelatvija.lv/>
- <http://www.homoecos.lv/>
- <https://www.csp.gov.lv/lv>
- Zaļā domāšana: <https://www.rimi.lv/padomi/padomi/ka-zala-domasana-un-atkritumu-skirosana-var-uzlabot-tavu-ikdienu>
- <https://www.zalais.lv/>
- <http://bezatkritumiem.lv/ko-darit/>
- <https://www.tirailatvijai.lv/izglitojosie-materiali>
- <http://www.zalajosta.lv/lv>
- <https://skirostiklu.lv/lv/karte?start=1>
- TV raidījums “Soli priekšā” 12 tēmas. Atrodi savam tematam atbilstošo un noskaties:
<http://www.zalajosta.lv/lv/televizijas-raidijumu-cikls-soli-prieksa>
- Uzņēmējdarbība https://lv-pdf.panda.org/iesaisties/zalais_birojs/





Adresāti:  Babulis Āris (skolēns), 11.a
Autors: Sirmace- Liedskalniņa Zane (darbinieks)
Datums: 11.04.2022 10:49
Temats: Re: anketa par atkritumu šķirošanas paradumiem

Tev anketā viena lieta, ko atceros- pārtikas atkritumu daudzums ir domāts 1 dienā, 1 nedēļā vai 1 mēnesī vai kādā citā laika periodā?

Vēl- ļoti jauki, ka ir pieliktas saites, kur izglītoties par jautājumiem.

Bet jautājumi, kuros vaicājāt- vai zināji, ka Aizkrauklē ir 6 bio atkritumu šķirošanas vietas- ko īsti uzzināsiet? Ja jautātu- cik, varētu zināt precizāk cilvēku informētību par šo. Arī jautājumi par atkritumu cenu.

Kopumā- saturīga anketa. Lai izdodas savākt pietiekamu respondentu skaitu!

No: Babulis Āris (skolēns), 11.a

Kad: 09.04.2022. 17:58

Kam: Sirmace- Liedskalniņa Zane (darbinieks)

Tēma: anketa par atkritumu šķirošanas paradumiem

<https://forms.gle/ywEsDHBFi97eZV2V6>

Inquiry-based learning activity FOR STUDENTS

Step 4 : Work on the research (Investigation, conclusion)

Acquisition : 5 min

Introduction of the lesson activities.

Investigation : 35 min

Analyze the information, collect data through Google Forms, surveys, interviews

Discussion : 20 min

Students articulate their ideas about research work, evaluate their progress, control the tasks

Collaboration : 20 min

Continue work on their work tasks for all together and individual

Production : 120 min

Homework in the groups for preparing the final work

Production : 40 min

Students make conclusions, presentation and the final product-brochure, or Infogram, blog

Acquisition : ... min

Practice : ... min

Production : ... min

Collaboration : ... min

Investigation : ... min

Discussion : ... min

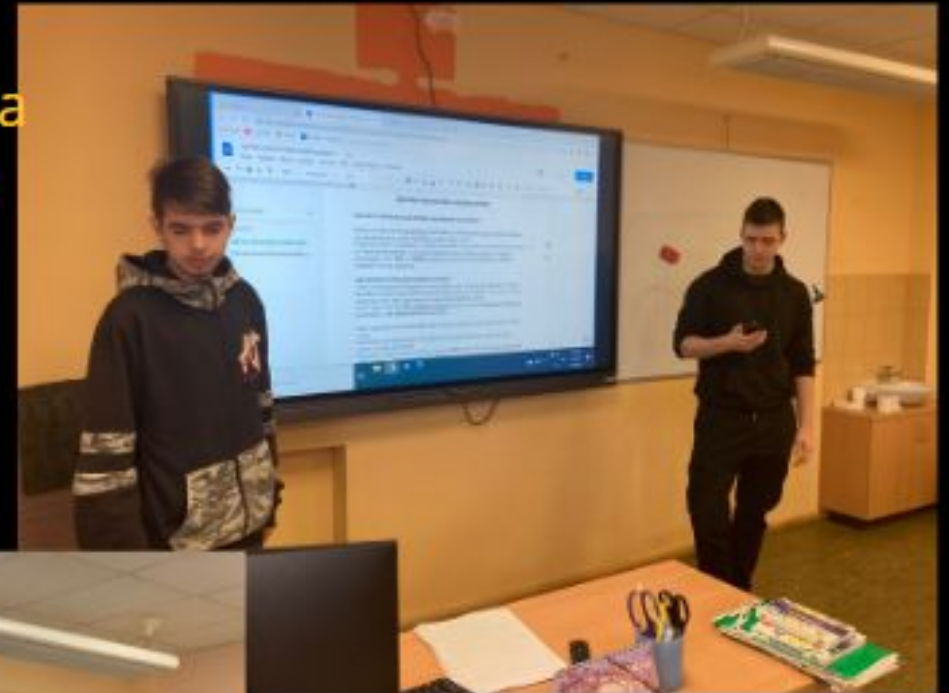


IBL phase 4:

Answering the research question. Self-monitoring of work progress.
Compilation of work results



Darba progresā
paškontrole-
pašvadīta
mācīšanās



Atbildēšana uz
pētāmo jautājumu



Darba rezultātu
apkopošana



IBL phase 4:

Preparation of the presentation

Creation of research work product

Pētījums

Saruna ar Aizkraukles novada

Uzņēmējdarbības speciālisti Baibu Kelleri

Cik uzņēmumu ir Aizkrauklē?

"Aizkraukles novadā pēc SIA "Lursoft IT" datiem 2021.gada 15.februārī kopumā reģistrēti aktīvi 2158 uzņēmumi, taču Aizkrauklē (pagastu ieskaitot) -482."

Cik no tiem iesaistās aprites ekonomikā?

"Grūti spriest, jo paši neesam veikuši uzskaiti par šādiem uzņēmumiem, daži mums ir zināmi, kā piemēram, uzņēmumi kā "pARTapis", "Krauss", "Rīta Putni".

Šāda veida uzskaitē mums pašiem būtu noderīga."



Inquiry-based learning activity FOR STUDENTS


Step 5 : Evaluation and self- evaluation of research work (conclusion)

Practice

 :40 min

Students get a work-sheet to evaluate themselves and their group work, explain their benefits

Acquisition

 : ... min

Practice

 : ... min

Production

 : ... min

Collaboration

 : ... min

Investigation

 : ... min

Discussion

 : ... min

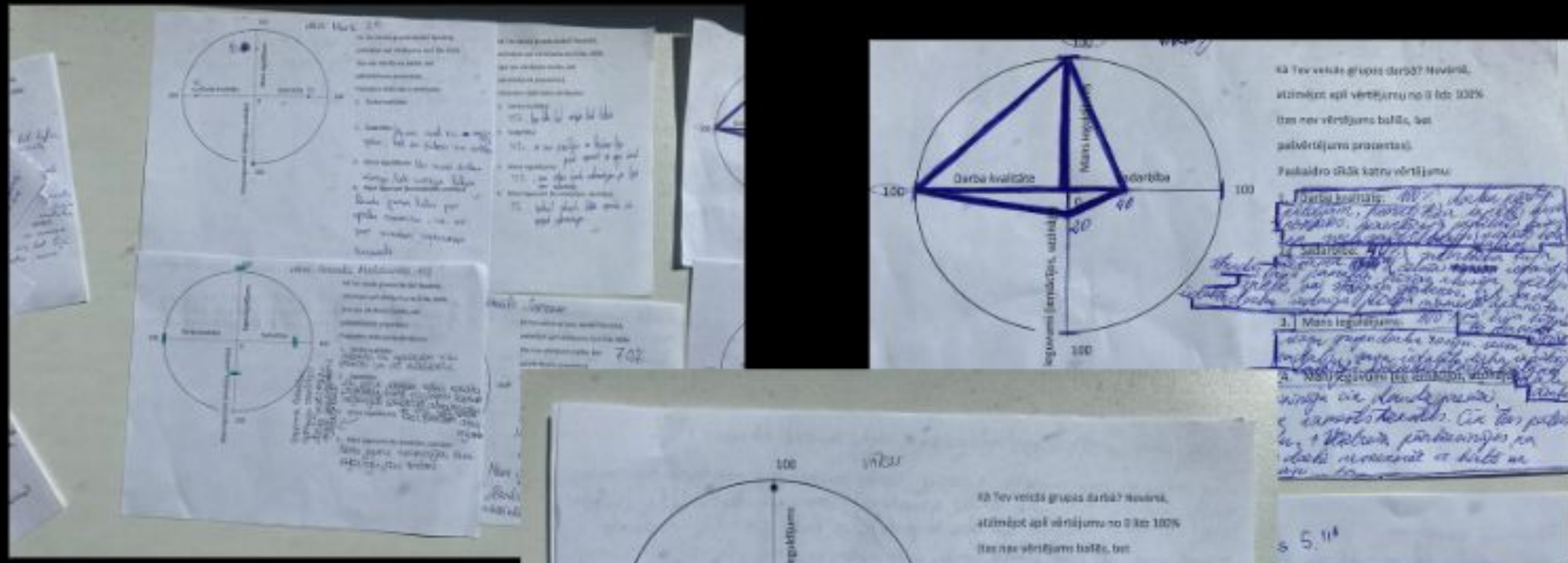


IBL phase 5:

Evaluation and self- evaluation of research work (conclusion).

Quality of work, cooperation, own contribution, benefits;

Group work and self-assessment and teacher assessment



**Darba kvalitāte,
sadarbība, paša
ieguldījums,
ieguvumi**

**Grupas darba
pašvērtējums un
skolotāja vērtējums**

Inquiry-based learning activities FOR STUDENTS

Minutes



Production Acquisition Collaboration Investigation Practice Discussion


The Circular Economy business models

- **The IBL project theme** «Involvement of companies in the Circular Economy in Aizkraukle»
- **Problem:** Entrepreneurs (as well as consumers) have to shift from linear economy to the circular economy, based on European Union sustainability strategy.
- **Research question:** How is the situation with sustainable business in Aizkraukle?
- EU, Latvia's and Aizkraukle's documentation about sustainability, 3 interviews, business website research

Product of the project: The short information for entrepreneurs

APRITES EKONOMIKA TAVĀ UZNĒMUMĀ

Informatīvs materiāls par aprites ekonomikas būtību un Tavām iespējām to īstenot savā uzņēmumā




KAS IR APRITES EKONOMIKA UN KĀDAS IR TAVAS IESPĒJAS?
Iepazīsties ar materiālu

APRITES EKONOMIKA

ir maksimāli lietderīgi (efektīvi) izmantot resursus ražošanā un sadzīvē, panākot, ka produkti, materiāli un dabas resursi saglabājas ekonomiskajā aprītē pēc iespējas ilgāk, tādējādi samazinot radīto atkritumu apjomu

PAŠREIZĒJĀ EKONOMIKA: RESURSU IEGUVE → **Panem** → **Izgatavo** → **Lieto** → **Izmet**


APRITES EKONOMIKA: RESURSU IEGUVE → **Panem** → **Izgatavo** → **Lieto** → **Savāc**



Biznesa modeļi:


- 1** APRITES PIECĀDES MODELIS - SAISTĪTS AR JAUNU RESURSU ATRAŠANU, IZVEIDOŠANU IEROBEŽOTU RESURSU VIETĀ.
PIEMĒRS IR SKOLĒNU MĀCĪBU UZNĒMUMS "SMU RE-GRAIN", KAS RAŽO ĒDAMUS VIENREIZLIETOJAMOS TRAUKUS.
- 2** RESRSU ATJAUNOŠANAS (ATGŪŠANAS) MODELIS - AR DAŽĀDIEM TEHNOLOĢISKIEM RISINĀJUMIEM TIEK IZMANTOTA RESURSA IZLAIDE, KAS NOVĒRŠ RAŽOŠANĀ SARĀŽOTO ATKRITUMU DAUDZUMU UN RESURSU NEPILNĪGU IZMANTOŠANU.
PIEMĒRS IR DEPOZĪTSISTĒMAS.
- 3** PRODUKTA DZĪVES ILGUMA PĀGARINĀŠANAS MODELIS - PAPLAŠINA SAVA PRODUKTA IZMANTOŠANU UN AKTĪVU TĀ DZĪVES IZMANTOŠANU.
PIEMĒRS IR UZNĒMUMS "RAMSICA", KAS IR LIETOTA APĢĒRBA VAIRUMTIRZNIČĪBAS UZNĒMUMS.
- 4** KOPLIETOŠANAS (DALĪŠANĀS) PLATFORMAS MODELIS - CENTRĒTS UZ PRODUKTU UN AKTĪVU KOPLIETOŠANU, KURIEM IR ZEMA ĪPAŠUMA VAI LIETOŠANAS LIKME.
PIEMĒRS IR UZNĒMUMS "BRĪVBODE", KURĀ VIENS ATSTĀJ SEV VAIRS NEPIELIETOJAMO, BET OTRS TO VAR PAŅĒMT BEZ MAKSAS.
- 5** PRODUKTA IZMANTOŠANA KĀ PAKALPOJUMS - IZMANTO PRODUKTU, IZMANTOJOT NOMAS VAI LIETOŠANAS MAKSAS REŽĪMU.
PIEMĒRS IR UZNĒMUMS "CITY BEE", KAS PILSĒTĀS NOMĀ AUTOMAŠĪNAS UZ NEILGU LAIKU.

SASKATI SEV TUVĀKO BIZNESA MODELI(MODEĻUS), KO SPĒJ ĪSTENOT UN TAVS UZNĒMUMS BŪS ILGTSPĒJĪGS UN IESAISTĪSIES APRITES EKONOMIKĀ.



"MĒS NEMANTOJAM SAVU ZEMI NO SAVIEM SENČIEM, MĒS TO AIZNEMAMIES NO MŪSU BĒRNIEM"

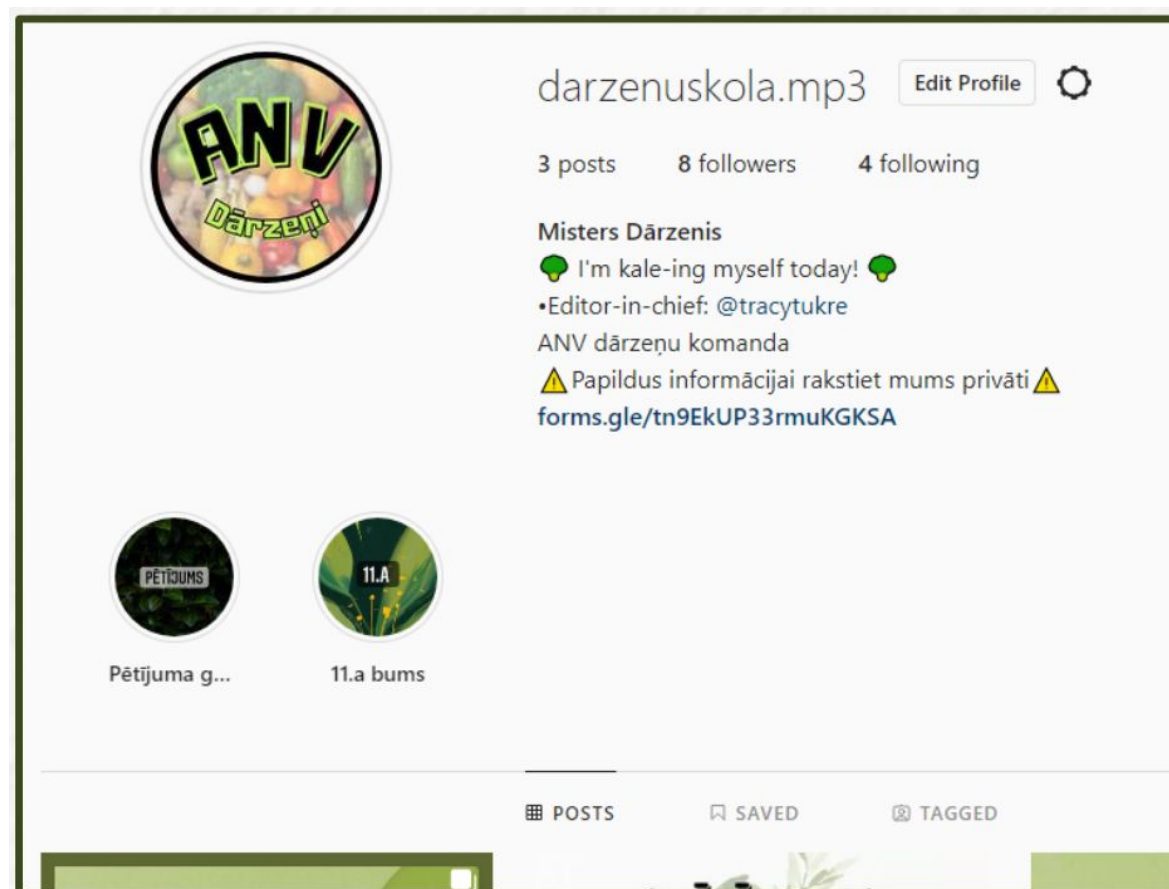
INFORMATĪVU MATERIĀLU VEIDOJA AMANDA MALATKOVSKA



Food and waste

- **The project theme** «Food in the circular economy»
- **Problem:** Food is an important part of human life. Food waste is growing every year. Other part of thr world's population is starving.
- **Research question:** what would happen if we all grew vegetables ourselves from tomorrow?
- Statistical data, calculations, survey

Product of the project: The booklet and Instagram page



Pārtika aprites ekonomikā

Pētāmais jautājums :

"Kas notiktu, ja
no rītdienas mēs
visi paši audzētu
dārzeņus?"



Izveidotās anketas dati:

94.7% dalībnieku ikdienā
lieto svaigus dārzeņus;
73.7% dalībnieku ir pieejama
platība dārzeņu audzēšanai;
78.9% dalībnieku konservē
dārzeņus ziemas periodam;
63.2% dalībnieku uzturā
vairāk lieto tomēr veikalā
pirktos dārzeņus;
68.5% dalībnieku ir iespēja
ilgstoši uzglabāt dārzeņus.

Datu aprēķins:

188.98 kg - vidējais dārzeņu
daudzums, ko cilvēks apēd 1
gada laikā ;
5 kg - maksimālais dārzeņu
daudzums, ko var izaudzēt 1 m² ;
188.98 / 5 = 37.8 m² - minimālā
zemes platība, kas
nepieciešama, lai izaudzētu
gada laikā apēsto dārzeņu
daudzumu.

Papildus informācijai izpētījam tādus jautājumus kā "Cik cilvēkiem
ir iespēja uzglabāt dārzeņus?", "Vai visiem būs laiks audzēt
dārzeņus?", "Kā tiks ietekmēts dārzeņu imports/eksports?", utt.

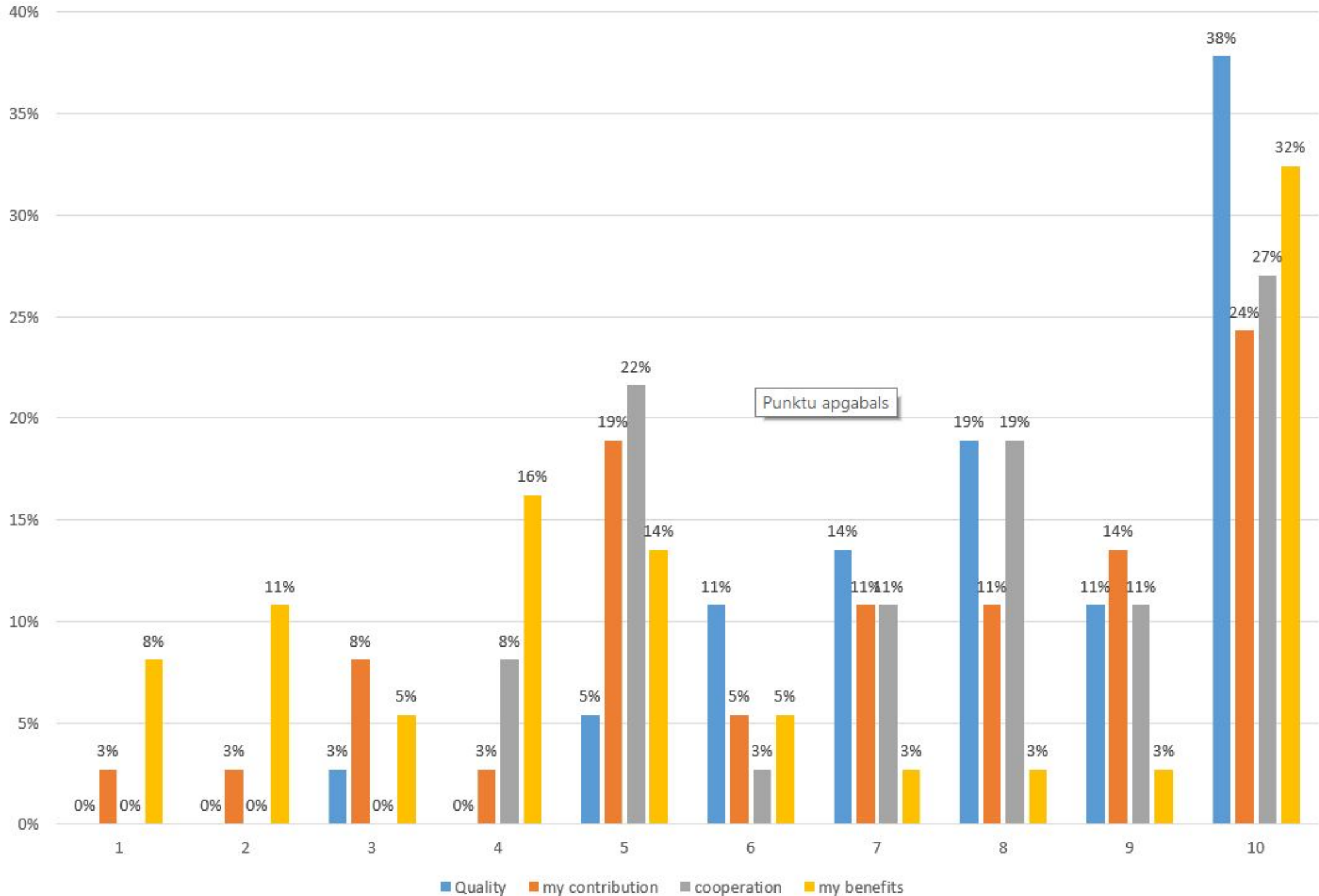
Secinājumi:

- Daudzi zemnieki vairs nebūtu spējīgi uzturēt savas saimniecības, trūktu labo sēklu, kvalitatīva mēslojuma, utt, taču vajadzība pēc tiem pieaugtu, lai varētu audzēt paši sev dārzeņus un paralēli arī izaudzēt eksportam ;
- Veikalos krasi zustu vai pieaugtu vērtība dārzeņiem, atkarībā no auglības sezonas un gadalaikiem (vasarā maza vērtība, ziemas periodā - augsta) ;
- Notiktu pretējais process urbanizācijai, daudzi pilsētnieki būtu spiesti pārvākties tuvāk lauku videi, lai varētu audzēt un kopt savus dārzeņus.

Lai garantētu to, ka katra cilvēka individuālā dārzeņu audzēšana neradītu liekus patēriņus un atkritumus, katram būtu jāiemācās kā tālāk izmantot dārzeņus, kas nav bijuši pietiekami kvalitatīvi vai iemācīties veidot komposta kaudzes.

SUMMARY of self-assessment of students' work

◆ Quality ◆ My contribution ◆ Cooperation ◆ My benefits



Student's benefits:

- The most important thing I learned is not to underestimate cooperation partners. These guys really surprised me with the quality of their work
- I learned more about research process rather than the research question
- I found out that our stores takes care of clean nature and as other countries handles food products
- I learned how to make questionnaires. I already knew about the research topic
- I learned little, but when I was looking for information about vegetables, I read some facts that I did not know
- I didn't learn much, I just repeated what I already knew.
- How to work in a team, how to plan work in a group, how to be a leader.
- I found out how much textiles are thrown away, how much money it consumes. I made sure again that group works are not always white and fluffy...
- I really enjoyed interviewing A.Priekule. No more shyness to write to strangers.
- I got really little
- People don't need me to create a questionnaire, but I need them to fill it out.
- Where, how people use textiles in everyday life. I learned to shorten text.
- In general, everything I knew, I had sorted food waste or taken it to the farm for chickens
- I found out where clothes and textile are recycled, what promotions are going on.
- To receive answers to questionnaire questions, you need to remind at least 10 times

Conclusions / recommendations for teacher

- Find more effective way for group work (how not to burden the responsible student)
- To spend more time for self-assessment
- To ask student's what they should do to get more benefits for themselves
- To make student's learning process more visible



ALZHABULES NOVADA
VIDUSSKOLA

Thank You!