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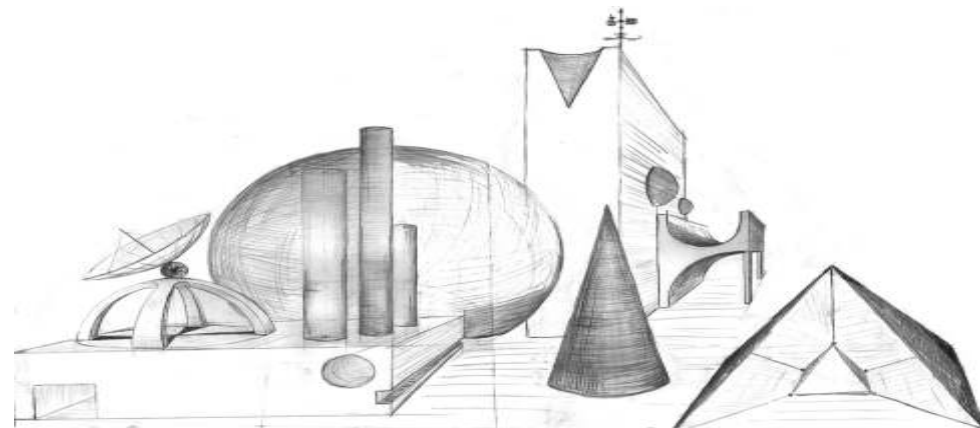
Občina Trbovlje



Občina Zagorje ob Savi



Občina Hrastnik



ZVEZA ZA TEHNIKO IN KULTURO SLOVENIJE

## 1. regijsko srečanje mladih raziskovalcev Zasavje 2016

*zbornik povzetkov raziskovalnih nalog*



Gimnazija in ekonomska  
srednja šola Trbovlje



Gimnazija in ekonomska  
srednja šola Trbovlje

Trbovlje, 5. 4. 2016

## KAZALO

STRO NICE IN POSLEDICE UŽIVANJA FIŽOLA .....	4
TORBA, ALI SI PRETEŽKA? .....	5
SKRB ZA OKOLJE NA NAŠI ŠOLI .....	6
ANA DIMNIK – TRBOVELJ ANKA, SLOVENKA .....	7
MED ALI KAJ DRUGEGA .....	8
KAKO ELEKTROMAGNETNO VALOVANJE VPLIVA NA LJUDI .....	9
NIHANJE IN REZONANCA MOSTOV .....	10
ARZEN IN ANTIMON V POVRŠINSKIH VODAH .....	11
BESEDOSLOVJE POKLICEV V ZASAVJU .....	13
IZ TRBOVELJ V HRIBE .....	14

*Vsi linki v zborniku so objavljeni, kot so jih posredovali avtorji.*

I put results in the table. Then I decided (with the help of my researches) which hill is the most suitable for which type of hiker (for example: families with kids, very active hikers, inactive hikers and so on). I realised that not every hill is for everyone. But however, I proved that there is at least one hill for anyone.

Key words: zasavje's hills, hiking, hiking paths, mountain lodges, Trbovlje

Avtorica: Ana Špajzer

Mentorica: Katarina Bola Zupan i

Šola: Gimnazija in ekonomska srednja šola Trbovlje

Področje raziskovanja: SŠ geografija

Key words: mining industry, minor's words, life in mine

Avtorica: Polona Majdi

Mentorica: mag. Maruša Stoklasa Dretnik

Sola: Gimnazija in ekonomska srednja šola Trbovlje

Področje raziskovanja: SŠ slovenščina



## IZ TRBOVELJ V HRIBE

### Povzetek

Zasavsko hribovje je del posavskega hribovja, ki leži na severu in jugu reke Save vse od Ljubljane do reke Sotle. Na severu ga omejujejo reke Nevljica, Motnišnica, Bolska, Voglajna, Šmarski potok in Mestinjska. Na jugu poteka meja po podoljih, kjer poteka tudi avtocesta Ljubljana – Zagreb. Predstavljajo ga hribovi, ki segajo do nekaj več kot 1000m. Zasavski hribovi so zelo obiskani in dostopni, zato sem se odločila da primerjam nekaj najbolj obiskanih, meni najbližjih hribov. Izbrala sem Mrzlico, Kal, Kum in Sveto Planino. V uvodu sem si zastavila, da dokažem, da se prav za vsakega najde kakšen kotiček v Zasavskem hribovju. Pri vseh vrhovih sem primerjala ponudbo in stanje planinskih koč, razglede z vrhov, stanje poti. Vse primerjave sem tabelirala. S pomočjo primerjav sem kasneje tudi izbrala kateri od izbranih vrhov je najbolj primeren za družine z otroki, za pohodnike, ki so že bolj izkušeni, za "izletnike", ki se na vrh raje pripeljejo z avtom in uživajo ob razgledu in prijetnem vzdušju v koči seveda pa nisem pozabila na začetnike, oziroma tiste, ki nimajo veliko kondicije za v hribe. Ugotovila sem, da nobeden od vrhov ni idealen za vsakega. Pri vsaki poti ali koči se najde kakšna pomanjkljivost. A vendar mi je uspelo dokazati, da se za vsakega najde vsaj en hrib, ki bi ga lahko obiskal vsaj enkrat na mesec.

Ključne besede: zasavsko hribovje, pohodništvo, planinske poti, planinske kočice, Trbovlje

### Abstract

Zasavje's hills are part of the Posavje's hills, which are located on southern and northern side of the Sava river all the way from Ljubljana to the Sotla river. On the north the hills border on the Nevljica river, Motnišnica river, Bolska river, Voglajna river, Šmarje stream in Mestinjska river. The southern border of Posavje's hills are valleys where highway Ljubljana – Zagreb takes place. The hills are around 1000m high. Zasavje's hills are very visited and easily accessible and that's why I decided to compare some of nearby hills. I chose Mrzlica, Kal, Kum and Sveta Planina. In the following introduction I decided to prove that for everyone there is at least one hill in Zasavje. I was comparing mountain lodges, views from the top, and paths.

## Nagovor ravnateljice GESŠ Trbovlje na poti prvemu regijskemu srečanju mladih raziskovalcev v Trbovljah

Dragi mladi raziskovalci, spoštovani mentorji, cenjeni ocenjevalci!

Vesela in ponosna sem, da je Zasavje postalo samostojna regija v sistemu tekmovanj mladih raziskovalcev Slovenije in da vas lahko nagovorim na prvem regijskem srečanju. Da mladi utrdite pripadnost domačemu okolju, izkazujejo tudi vaše raziskovalne naloge, ki v veliki meri obravnavajo lokalno tematiko. Zato sem prepričana, da smo upravičeni ali našo pobudo po samostojni regiji, ki so jo podrli tudi župani vseh treh zasavskih občin. Tudi na tem mestu se za njihovo podporo in sponzorstvo iskreno zahvaljujem.

Da na mladih svetovi stoji, je stara modrost. Prepričana sem, da boste velik del tega plemenitega bremena prevzeli ravno vi, ki ste pripravljeni narediti nekaj več, kot zahteva učni načrt. Vaše raziskovalne naloge so dokaz vaše vedoželjnosti, vaših talentov in vašega zavedanja, da se je potrebno do odgovorov dokopati z lastnim trudom. Znanje, ki ste ga pri tem pridobili, predstavlja trdne temelje vašega napredka. Raziskovalno delo pomeni najvišjo stopnjo uporabe pridobljenega znanja in je gonilo razvoja loveštva. Verjamem, da bomo čez nekaj let brali o vaših strokovnih raziskavah in takrat se bomo spomnili današnjega dne. Ponosni bomo, da ste kamenček na svoji poti do uspeha dodali ravno danes, tu.

Vsem sodelujočim raziskovalcem, mentorjem in ocenjevalcem se zahvaljujem za vaš prispevek in vam želim še obilo veselja in uspehov na raziskovalnem področju.

Jelena Keršnik, ravnateljica

### Povzetek

Za temo raziskovalne naloge sem si izbrala stro nice, saj je OZN leto 2016 razglasila za Mednarodno leto stro nic.

V raziskovalni nalogi bom predstavila vrste stro nic in njihove lastnosti. Nato se bom posvetila stro nici, ki je v Sloveniji najbolj poznana – fižolu. Torej fižol bom predstavila od njegovega vzklitja do posledic, ki jih imamo pri uživanju le-tega.

Cilj raziskovalne naloge je predstavitev stro nic, pridelava fižola in ugotovitve posledic njegovega uživanja. Del naloge bom opremila tudi s podatki iz ankete, ki jo bom opravila z lokalnimi vrtnarji.

Ključne besede: stro nice, fižol, posledice uživanja fižola, vetrovi.

### Abstract

The theme of my study are pulses due to the fact that United Nations 2016 declared as the international year of pulses.

The present study introduces the types of pulses and their characteristics. In the following the most known Slovene type of pulses is presented i. e. beans. Accordingly, beans are presented from the germination to the implications arising from the eating of beans.

The study aim is to present pulses, the cultivation of beans and findings regarding the beans eating implications. The part of my study is equipped with the data obtained from the survey implemented among our local growers.

Key words: pulses, beans, beans eating implications, flatulence

Avtorica: Špajzer Nika

Mentorica: Ljudmila Gornik

Somentorici: Vesna Žnidar Kadunc, Romana Verdel

Šola: Osnovna šola narodnega heroja Rajka, Hrastnik

Področje raziskovanja: OŠ biologija

### Povzetek

Rudarstvo je gospodarska panoga, ki se ukvarja z izkoriščanjem rudnih bogastev. V preteklosti je bil to pomemben poklic in vir zaslužka predvsem za revne. Značilnost rudarjev je bila predvsem njihova obleka, ki so jo sestavljale rjave hlače in suknji, rjavna kapa in bele rokavice. Posebnost je 28 zlatih gumbov na suknjiču, ki naj bi predstavljali starost njihove zavetnice, svete Barbare, ko je umrla.

V Sloveniji so prevladovali manjši rudniki, kot so rudnik živega srebra v Idriji in rudnik svinca in cinka v Mežici. Seveda pa pri prevladujejo njih nahajališča ne smemo izpustiti nahajališča premoga, ki ga je največ v območju Trbovelj, Hrastnika ter v Zagorju. Poleg tega, da so rudarji v rudnikih trdgarali, pa se je skozi leta tudi oblikoval njihov žargon, torej rudarski jezik.

V raziskovalni nalogi sem se predvsem osredotočila na jezik rudarjev, saj se mi je zdi, da se dandanes zelo izgublja, predvsem me je zanimalo tudi kakšne so razlike v poznavanju rudarstva in rudarskih besed med mladimi in starimi. V ta namen sem izvedla anketo, ki mi je pokazala rezultate. Prav tako sem se obrnila na dva starejša gospoda, rudarja v pokoju, da sta mi povedala kaj več o njih življenjih. Izvor besed pa je prav tako pomemben za razvoj in ohranjanje jezika, zato me je tudi zanimalo iz kje izvirajo besede.

Ključne besede: rudarstvo, rudarske besede, življenje v rudniku

### Abstract

Mining industry is the economic branch that deals with the exploitation of mineral resources. In the past this was an important profession and source of income especially for the poor people. The characteristic of the miners was, above all, their dress which consisted of black pants and jacket, black cap and white gloves. A special feature is the 28 gold buttons on the jacket which are representing the age of their patroness saint Barbara when she died.

In Slovenia the majority of smaller mines, such as mine of mercury in Idrija and the mine of lead and zinc in Mežica. Of course, in the prevailing deposits should not be omitted deposits of coal, which is the highest number in the range of Trbovlje, Hrastnik and Zagorje. In addition to the miners they worked hard in the mines, but through the years they also developed their jargon – the mining language.

In the research thesis, I mainly focused on the language of the miners because to me it seems that nowadays in losing, mainly I wanted to know if there are any differences in the knowledge of mining and the mining words between young and elder people. For this purpose I have conducted a survey, which has shown me results. I also turned to two older men who were miners, that they told me anything more about their lives. The origin of the words is also important for the development and preservation of the language, so I was also interested where the words come from.

V raziskovalni nalogi sem potrebovala dva vzorca vode iz vsakega potoka. Nadaljnje analize so pokazale, da se arzen in antimon nahajata v potokih. Ugotovila pa sem, da vrednosti niti enega, niti drugega niso blizu mejne vrednosti, kaj šele, da bi jo presegle v obeh preu evanih potokih. Opazim lahko, da rudnik ima vpliv na Kotredeš ico vsaj v zgornjem toku, saj so tu vrednosti antimona najvišje.

Zaključim torej lahko, da rudnik nima vpliva na Trboveljš ico. O hitro izviri nimajo stika z antimonom. Prav tako sem pokazala, da med potokoma ni povezave in da je voda, glede arzena in antimona, nesporna in v okviru vseh mejnih vrednosti.

Ključne besede: arzen, antimon, Kotredeš ica, Trboveljš ica, vrednost

#### Abstract

Mountain ridge spreads all the way from Trojane, over emšeniška planina, Javor until Mrzlica. Because in the western part of this ridge appear deserted mines, which cause chemical contamination of surface waters, there is a possibility that the entire ridge contains arsen and antimony. Therefore, the possibility of contamination is not only in the western but also in the central part, in the valley of Trboveljš ica.

Values of arsen and antimony are said to be quite above the limit in Kotredeš ica. The cause is mostly closed antimony mine Trojane – Znojile which has never been sanitized and is located right above the source of the stream.

In my research I needed two samples of water from each stream, Further analyzes showed that arsen and antimony are located in both streams. I found out that the value of one or another is not even close to the limit. The mine has an impact on Kotredeš ica, at least in its upper flow because there are values of antimony the highest.

The result is that the mine has no effect on Trboveljš ica. Apparently sources have no contact with antimony. I've also shown there is no connection between these two streames. The water is obviously, according to arsen and antimony, undisputed and within all limits.

Key words: arsen, antimony, Kotredeš ica, Trboveljš ica, value

Avtorica: Nina Štrovs

Mentor: Aleksander Medveš

Šola: Gimnazija in ekonomska srednja šola Trbovlje

Področje raziskovanja: SŠ Kemija

## TORBA, ALI SI PRETEŽKA?

#### Povzetek

Raziskovalna naloga v izhodišču e postavlja šolske torbe – natan neje, njihovo maso. Zanimalo nas je, ali je ta res prekomerna oziroma ve ja od priporo enih standardov. Ugotavljali smo tudi, kaj prekomerno maso povzro a in preverjali seznanjenost ljudi s priporo ili in možnimi zdravstvenimi posledicami.

K raziskavi smo najprej pristopili teoreti no in skušali pridobiti im ve informacij – intervjuvali smo šolsko zdravnico, opravili anketo med u enci, u itelji in starši ter poiskali in preu ili literaturo z obravnavanega podro ja. V prakti nem delu raziskave pa smo preverili maso sodelujo ih u encev ter njihovih praznih in polnih šolskih torb. Pri tem nas je zanimala tudi sama vsebina torb – morebitne odve ne potrebš ine v njih. Meritve smo v želji po im bolj natan nih rezultatih ponovili štirikrat zaporedoma (v razli nih dnevih tedna). Pridobljene informacije in rezultate smo analizirali in ugotovitve podali v raziskovalni nalogi.

Ključne besede: masa šolskih torbic, odve ne potrebš ine, masa u enca, zdravstveni zapleti, priporo ila

#### Abstract

The study deals with pupils' school bags i. e. their weight. We would like to determine if their weight was really too high according to the recommended standards. Additionally, we found out what caused the excessive weight and how well the people were informed of the standards and possible health problems.

In the beginning we started theoretically and tried to obtain as many information as possible – we interviewed our school dentist, our pupils, teachers and parents and we found and examined the literature regarding the above mentioned field. In the practical part of our study we verified the weight of the pupils participated as well as the weight of their empty and full schoolbags. We were interested in the contents of their schoolbags – eventual unnecessary requisites. Due to the fact that we wished to obtain as accurate measurements as possible the stated measurements were repeated four times (on different week days). We analyzed the obtained results and information as well as we specified all findings in the present study.

Key words: weight of the school bags, unnecessary requisites, pupil's weight, health problems, recommendations/standards

Avtorji: Brglez Živa, Klemen Ka i, Nina-Lana Vidmar

Mentorici: Ljudmila Gornik, Jasmina Štolfa

Šola: Osnovna šola narodnega heroja Rajka, Hrastnik

Področje raziskovanja: OŠ biologija

## SKRB ZA OKOLJE NA NAŠI ŠOLI

### Povzetek

V svoji raziskavi smo želeli ugotoviti, koliko in na kakšen način naša šola skrbi za čisto in varno okolje in osvešča učence o varovanju okolja.

Izdelali smo anketni vprašalnik za učence in učitelje. Izvedli smo intervju z ravnateljico naše šole. Poizvedovali smo, katere vsebine in dejavnosti na to temo že izvajamo, jih v nalogi na kratko predstavili ter predlagali, katere bi bilo mogoče še vključiti. Vse te dejavnosti smo izvajali zato, da bi sošolcem, staršem in delavcem šole pokazali, kako pomembno je okoljsko ozaveščanje in aktivno ravnanje pri okoljskih projektih.

Naša šola že vrsto let skrbi za varovanje okolja, med drugim tudi tako, da večkrat organizira akcijo zbiranja starega papirja ter spodbuja, ne le učence in delavce šole, temveč tudi starše ter ostale prebivalce občine Hrastnik k odgovornemu ravnanju z odpadki, vodo in električno energijo. Zavedamo se, kako pomembno je ohranjati čisto okolje in s tem razlogom smo aktivni in spodbujamo tudi ostale.

Ključne besede: Skrb za okolje, osveščanje učencev o varovanju okolja, vsebine in dejavnosti na to temo, aktivno ravnanje pri okoljskih projektih, odgovorno ravnanje z odpadki, vodo in električno energijo.

### Abstract

In our study we were trying to figure out how much and in what way our school is responsible for unpolluted and safe environment as well as for raising the awareness of pupils on environmental protection.

We elaborated a questionnaire for pupils and teachers. We performed the interview with our headmistress. We tried to determine which contents and activities regarding the present topic have already been implemented and to introduce them briefly as well as to propose which new ones could be incorporated in the future. All the above stated activities were carried out to show our classmates, parents and school staff the importance of environmental awareness and active management of environmental projects. Within the domain of our school the environment protection including the organized campaign to collect waste paper and to encourage pupils, school staff, parents and other residents of the municipality of Hrastnik to behave responsibly with regard to waste, water and power supply management have been our priorities for many years. We are fully aware of the importance to maintain unpolluted environment and therefore we responsibly act regarding the stated as well as encourage other residents of Hrastnik.

### Abstract

Physics (Ancient Greek: *phusik* (epistemes me) - knowledge of the nature)

The mere word physics tells us that it is a science that is related to the nature, processes and activities in nature. Physics is the foundation of all natural sciences, which was developed from the study of nature and was called philosophy of nature up to about the 19th St. This research project is divided in two parts, theoretical and research part. In theoretical part I explained oscillations, resonance and their influence. I used theoretical part for easier understanding of the causes for the collapse and the comparison of collapses. In the research I used three examples of bridges. I chose precisely these bridges because I could do a best comparison to each other. For example, I compared two bridges, which have the same carrier system and the same purpose, only that they were built at different time and from different materials. The third bridge has a different purpose, carrier system and material. With this I can compare how the material, carrier system and purpose affect bridges. Millennium bridge is different from other two because it has never collapsed. I chose it because I wanted to show, that if we take immediate action, we can prevent crashes. My biggest finding was that although vibrations and resonance have effect on the bridges. They will not collapse, if they are properly constructed. In the theoretical part I learned about oscillations. If we observe oscillation in the real situation, we find that there is so many other factors, such as dismaintained bridges, weather conditions, improper construction, etc., which have an impact on oscillation.

Key words: resonance, bridges, oscillation.

Avtorica: Selma Poljakovi

Mentorica: Petra Zelenšek

Šola: Gimnazija in ekonomska srednja šola Trbovlje

Področje raziskovanja: SŠ fizika



## ARZEN IN ANTIMON V POVRŠINSKIH VODAH

### Povzetek:

Gorski hrbet se vleče od Trojan, preko emšeniške planine, Javorja do Mrzlice. Ker se v zahodnem delu tega hrba pojavljajo opuščeni rudniki, katerih posledica je kemijsko onesnaženje površinskih voda, obstaja možnost, da ta celoten hrbet vsebuje arzen in antimon. Zato je možnost onesnaženja ne samo v zahodnem, ampak tudi v centralnem delu, to je v poreklu Trboveljske.

Vrednosti arzena in antimona naj bi kar precej presegale mejno vrednost v Kotredešici, vzrok pa naj bi bil predvsem zaprt, vendar nikdar saniran antimonov rudnik Trojan – Znojile, ki se nahaja nad izvirom potoka.

Even more I wondered why younger generations are addicted to phones, what may be the consequences and how to reduce that addiction – with education, first contact with phones and later on.

My conclusions of the short survey among school children and findings from the literature suggest similar things. Students and their parents are not aware that the use of phones and the variety of applications they offer, especially games in a relatively short period of use causes a kind of addiction, in most cases can even cause permanent damage.

Avtorica: Maja Trobevšek

Mentorica: Katja Dragar

Šola: Osnovna šola Trbovlje

Področje raziskovanja: OŠ biologija



## NIHANJE IN REZONANCA MOSTOV

Povzetek

Že sama beseda fizika nam pove, da je veda, ki je povezana z naravo, procesi in delovanjem v naravi. Fizika je temelj vseh naravoslovnih znanosti, ki se je razvila iz proučevanja narave in so jo do okoli konca 19. st. imenovali filozofija narave. Raziskovalna naloga je razdeljena na dva dela. Na teoretični in raziskovalni del. V teoretičnem delu sem razložila nihanje in resonanco in njihov vpliv. Teoretični del sem uporabila za lažje razumevanje vzrokov za zrušitev in za kasnejšo primerjavo. V raziskovalnem delu sem uporabila 3 primere mostov. Izbrala sem si prav te mostove zato, ker sem lahko našla najboljše in primerjala med sabo. Za primere sem vzela dva mosta, ki imata enak nosilni sistem in enak namen samo, da sta bila zgrajena v različnem obdobju in iz drugačnih materialov, tretji most pa je imel drugačen namen nosilni sistem in material. S tem sem lahko primerjala kako material, nosilni sistem in namen vplivata na mostove. Posebnost Millennium mosta je ta, da se ni zrušil in sem ga izbrala prav zato, ker sem hotela pokazati, da se lahko ukrepamo lahko preprečimo zrušitve. Moja največja ugotovitev je bila ta, da se nihanje in resonanca vplivata na mostove se ne bodo zrušili in so pravilno zgrajeni. V teoretičnem delu sem se naučila o nihanju ampak se prenesemo nihanje v resnične situacije ugotovimo, da je še veliko drugih dejavnikov, kot so ne vzdrževanje mostov, vremenski pogoji, nepravilna gradnja, itn, ki vplivajo na nihanje.

Ključne besede: resonanca, nihanje, mostovi.

Key words: Environment concern, awareness of pupils on environmental protection, contents and activities regarding the stated, active management of environmental projects, responsible waste, water and power supply management

Avtorji: Ana Špajzer, Živa Brglez, Ana Kovacic

Mentorica: Ljudmila Gornik

Šola: Osnovna šola narodnega heroja Rajka, Hrastnik

Področje raziskovanja: OŠ ekologija

## ANA DIMNIK – TRBOVELJ ANKA, SLOVENKA

Povzetek

Dimnikova hiša v Trbovljah skriva zaklad, ki ga ne poznajo niti Trboveljani niti obiskovalci Trbovelj. Mislimo, da je kulturna dediščina, ki nam jo je zapustila Ana Dimnik, vredna, da jo ponosno predstavimo širši slovenski javnosti.

Ana Dimnik je bila predana mama sinu Ivanu, poslovna ženska in velika domoljubka. Skrbela je za družino, še posebej za sina, ki se je šolal doma in v tujini. Skrbela je za dom in vrt, pomagala vsem, ki so jo prosili. Vodila je gostilno, svoje zasluge pa znala deliti med pomožni in potrebne. Zavzemala se je za svoje ideale; bila je velika ljubiteljica vsega slovenskega: jezika, glasnikov in knjig, kulturnih dogodkov in društvenega udejstvovanja.

Zaradi njene zasebne in javne angažiranosti se je je prijelo ime "slovenska mati" iz Trbovelj.

Spominska soba ponudi vpogled v njeno zasebno in javno življenje, na ogled so številni avtentični dokumenti iz druge polovice 19. stoletja. Turiste vabimo v Trbovlje, še posebej v Anino spominsko sobo.

Ključne besede: Dimnikova hiša, predana mama, poslovna ženska – gostilniška arka, zavedna Slovenka, spominska soba

Abstract

The family Dimnik's house in Trbovlje hides a special treasure that has not been well known. The authors of this research paper believe that the cultural heritage left by Ana Dimnik is worth being presented to the wider Slovenian public.

Ana Dimnik was a dedicated mother to her son Ivan, she was a business woman and a great patriot. She took care of her family, particularly for her son who got education in the home land and abroad. She also took care of their home and garden, and she was always willing to help other people.

She ran the inn and the profit made by it was often shared among the people in need. She stood up for her beliefs. She was an important supporter of the use of the Slovene language in the public life, the use of some Slovene newspapers and books, she supported some cultural events as well as different society activities.

She was called "the Slovene mother" from Trbovlje for her enthusiastic private and public engagement. Ana Dimnik's memorial room provides an insight into her private and public life. There are several authentic documents from the second half of the 19th century to be found in the room. Tourists are welcome to Trbovlje, particularly to Dimnik's memorial room.

Key words: the family Dimnik's house, a dedicated mother, a business woman – an inn owner, a Slovene patriot, a memorial room

Avtorja: Lora Naglav, Blaž Cestnik

Mentorica: mag. Mojca Lazar Doberlet

Šola: Osnovna šola Ivana Cankarja

Področje raziskovanja: OŠ zgodovina



## MED ALI KAJ DRUGEGA

### Povzetek

Idejo za raziskovalno nalogo sva dobili ob prebiranju članka »Ali nam cvetni prah lahko pove, kakšen med jemo?« Ker se raziskovalnih nalog lotevava prvič, sva se pri izvedbi naloge osredotočili na razvijanje metod in oblik dela, s katerimi se da odgovoriti na zgornje vprašanje. Tako sva raziskali, kakšne vrste medu najdemo na našem tržišču, kako se lahko določi vrsto pelodnega zrna v medu ter katere vrste medu vsebujejo pelodna zrna in katere ne.

Sledilo je raziskovanje pod mikroskopom. Želeli sva poiskati metodo, s katero lahko določimo, kakšen med jemo.

Najine ugotovitve so naslednje:

1. Preiskovali sva dve vrsti medu, v katerih nisva našli sledi pelodnih zrn. Lahko sklepava, da nista prava.
2. Ugotovili, da Medex prodaja kvalitetne vrste medu.
3. Z raziskovalno nalogo sva se naučili nekaj novih tehnik raziskovanja, ki jih pri pouku nisva usvojili (samostojno mikroskopiranje, priprava preparatov).

### Abstract

We got the idea for our assignment after reading an article called "Ali nam cvetni prah lahko pove kakšen med jemo or can pollen tell us what kind of honey we eat?". Since this is our first time doing this kind of an assignment we decided to focus on evolving different methods and approaches of research by which we could answer the given question. So we tried to find out what sorts of honey can be found on our market, how can sorts of pollen seeds be defined. We tried to answer the question which sorts of honey include pollen seeds. Then it was time to use the microscope. We wanted to find a method by which we could define what kind of honey we eat.

These are our findings:

1. We studied two types of honey where we didn't find pollen seeds. So they are probably unreal.
2. We have noted that Medex sells quality honeys.
3. We have also learned some new techniques of exploration, which we didn't know before.

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Področje raziskovanja: OŠ biologija



## KAKO ELEKTROMAGNETNO VALOVANJE VPLIVA NA LJUDI

### Povzetek

Ugotavljam, da so nekateri moji sošolci na trenutke napeti, razdražljivi, da komaj čakajo, konec pouka, ko lahko »ekirajo« kaj je novega na socialnih omrežjih. Zaradi vsakodnevnih opažanj, me je zanimalo kaj pravijo o tem, da so moji vrstniki bili zasvojeni s telefoni in kaj so o tem v svetu že raziskali. Z raziskavo sem želela izvedeti, kakšen učinek imajo različne oblike elektromagnetnega valovanja na ljudi - tako psihično, kot fizično. Še bolj pa me je zanimalo, zakaj so mladostniki zasvojeni s telefoni, kakšne so lahko posledice in kako zmanjšati zasvojenost - tako z vzgojo, prvim stikom, kot v nadaljevanju.

Zaključki kratke ankete med osnovnošolci in izsledki iz literature kažejo podobno. Učenci, kot kdaj tudi njihovi starši, se ne zavedajo, da uporaba telefonov v različne namene, predvsem pa igranje igrice, pri njih v relativno kratkem času uporabe teh sredstev povzroči neke vrste odvisnost, v večini primerov ne gre za neposredne trajne poškodbe ali celo smrti.

Ključne besede: osnovnošolci, telefon, elektromagnetno valovanje

### Abstract

When I walk through the school corridor, go to the bathroom,... - everywhere, although there should not be, there are students with phones. A similar story is happening in the afternoons. I notice that some of my classmates are at times tense, irritable and can hardly wait for the end of the lesson, so they can check what's new on the social networks. Because of my everyday observations, I was interested in what they have to say about the fact that they may be addicted to phones and what about that was already explored in the world. With this research I wanted to find out what effects different forms of electromagnetic radiation have on people - both mental and physical.