

Table of genera and taxonomic notes arranged by morphological group and number of images in the Level 1 Certification Exam. Refer to page 4 for more details.

Genus	Notes	Abundance	Difficulty	No. of Images
Centric Genera				
<i>Thalassiosira</i>	Distinguish from <i>Stephanodiscus</i>	3	4	5
<i>Aulacoseira</i>	Distinguish from <i>Melosira</i>	4	1	4
<i>Lindavia</i>	Distinguish <i>Lindavia</i> , <i>Cyclostephanos</i> , <i>Cyclotella</i> , <i>Discostella</i> , <i>Stephanodiscus</i> , <i>Thalassiosira</i>	2	3	4
<i>Stephanodiscus</i>	Distinguish <i>Lindavia</i> , <i>Cyclostephanos</i> , <i>Cyclotella</i> , <i>Discostella</i> , <i>Stephanodiscus</i> , <i>Thalassiosira</i>	4	1	4
<i>Cyclostephanos</i>	Distinguish <i>Lindavia</i> , <i>Cyclostephanos</i> , <i>Cyclotella</i> , <i>Discostella</i> , <i>Stephanodiscus</i> , <i>Thalassiosira</i>	2	2	3
<i>Cyclotella</i>	Distinguish <i>Lindavia</i> , <i>Cyclostephanos</i> , <i>Cyclotella</i> , <i>Discostella</i>	2	1	2
<i>Discostella</i>	Distinguish <i>Lindavia</i> , <i>Cyclostephanos</i> , <i>Cyclotella</i> , <i>Discostella</i>	2	1	2
<i>Chaetoceros</i>		1	1	1
<i>Melosira</i>	Distinguish from <i>Aulacoseira</i>	1	1	1
<i>Orthoseira</i>		1	1	1
<i>Pleurosira</i>		1	1	1
<i>Skeletonema</i>		1	1	1
<i>Terpsinoe</i>		1	1	1
<i>Urosolenia</i>		1	1	1
Araphid Genera and Eunotia				
<i>Fragilariforma</i>	Distinguish from <i>Stauroforma</i>	3	4	5
<i>Pseudostaurosira</i>	Check SEM features	4	2	5
<i>Staurosira</i>	Check SEM features	4	2	5
<i>Staurosirella</i>	Check SEM features	4	4	5
<i>Ulnaria</i>	Distinguish from <i>Fragilaria</i>	4	2	5
<i>Fragilaria</i>	Distinguish from <i>Ulnaria</i>	4	1	4
<i>Asterionella</i>		3	1	3
<i>Diatoma</i>		3	1	3
<i>Meridion</i>		3	1	3
<i>Odontidium</i>	Distinguish from <i>Tetracyclus</i>	3	1	3
<i>Opephora</i>	Distinguish from <i>Staurosirella</i>	3	1	3
<i>Stauroforma</i>	Distinguish from <i>Fragilariforma</i>	3	1	3
<i>Tabularia</i>		3	1	3
<i>Tabellaria</i>		2	1	2
<i>Ctenophora</i>		1	1	1
<i>Hannaea</i>		1	1	1
<i>Tetracyclus</i>	Distinguish from <i>Odontidium</i>	1	1	1
<i>Eunotia</i>		4	2	5

Genus	Notes	Abundance	Difficulty	No. of Images
Symmetric Biraphid Genera				
<i>Sellaphora</i>	Small-celled <i>Sellaphora</i> , <i>Mayamaea</i> , <i>Adlafia</i> , <i>Fistulifera</i> , <i>Craticula</i> are challenging	4	6	5
<i>Mayamaea</i>	Small-celled <i>Sellaphora</i> , <i>Mayamaea</i> , <i>Adlafia</i> , <i>Fistulifera</i> , <i>Craticula</i> are challenging	3	6	5
<i>Adlafia</i>	Small-celled <i>Sellaphora</i> , <i>Mayamaea</i> , <i>Adlafia</i> , <i>Fistulifera</i> , <i>Craticula</i> are challenging	3	5	5
<i>Navicula</i>	Morphologically diverse. <i>Navicula sensu stricto</i> have lineolae (lineolate striae)	4	4	5
<i>Geissleria</i>	Distinguish from <i>Placoneis</i> , <i>Adlafia</i> . Annulae are not always visible	2	5	5
<i>Placoneis</i>	Distinguish from <i>Geissleria</i> , <i>Adlafia</i>	3	2	4
<i>Pinnularia</i>	Distinguish from <i>Caloneis</i>	4	1	4
<i>Stauroneis</i>		4	1	4
<i>Anomoeoneis</i>	Check the spelling!	3	1	3
<i>Brachysira</i>		3	1	3
<i>Chamaepinnularia</i>	Check the spelling!	3	1	3
<i>Craticula</i>	Small-celled <i>Sellaphora</i> , <i>Mayamaea</i> , <i>Adlafia</i> , <i>Fistulifera</i> , <i>Craticula</i> are challenging	2	2	3
<i>Diadesmis</i>	Distinguish from <i>Humidophila</i>	3	1	3
<i>Diploneis</i>		3	1	3
<i>Fallacia</i>	Distinguish from <i>Sellaphora</i>	3	1	3
<i>Gyrosigma</i>	Distinguish from <i>Pleurosigma</i>	3	1	3
<i>Hippodonta</i>		3	1	3
<i>Humidophila</i>	Distinguish from <i>Diadesmis</i>	3	1	3
<i>Luticola</i>		3	1	3
<i>Mastogloia</i>	Check for partecta	3	1	3
<i>Muelleria</i>		3	1	3
<i>Neidiopsis</i>		3	1	3
<i>Neidium</i>		3	1	3
<i>Caloneis</i>	Distinguish from <i>Pinnularia</i>	2	1	2
<i>Cavinula</i>		2	1	2
<i>Frustulia</i>		2	1	2
<i>Nupela</i>	Distinguish from <i>Achnantheidium</i>	2	1	2
<i>Amphipleura</i>		1	1	1
<i>Capartogramma</i>		1	1	1
<i>Cosmioneis</i>		1	1	1
<i>Fistulifera</i>	Small-celled <i>Sellaphora</i> , <i>Mayamaea</i> , <i>Adlafia</i> , <i>Fistulifera</i> , <i>Craticula</i> are challenging	1	1	1
<i>Kraskella</i>	Distinguish from <i>Achnantheidium</i>	1	1	1
<i>Microcostatus</i>		1	1	1
<i>Parlibellus</i>		1	1	1
<i>Pleurosigma</i>	Distinguish from <i>Gyrosigma</i>	1	1	1

Genus	Notes	Abundance	Difficulty	No. of Images
Monoraphid Genera				
<i>Achnantheidium</i>	Distinguish from <i>Achnanthes</i> , <i>Rossithidium</i>	4	2	5
<i>Cocconeis</i>		4	5	5
<i>Rossithidium</i>	Distinguish from <i>Achnantheidium!</i>	3	4	5
<i>Lemnicola</i>	Rapheless valve may be confused with <i>Achnantheidium</i>	3	2	4
<i>Planothidium</i>	The hood on the rapheless valve is distinctive, but some species have a rimmed depression instead	4	1	4
<i>Achnanthes</i>	Distinguish from <i>Achnantheidium</i> , <i>Rossithidium</i>	3	1	3
<i>Euococconeis</i>	Distinguish from <i>Psammothidium</i>	3	1	3
<i>Karayevia</i>		3	1	3
<i>Platessa</i>		3	1	3
<i>Psammothidium</i>	Distinguish from <i>Achnantheidium</i> , <i>Achnanthes</i> , <i>Euococconeis</i>	2	2	3
Asymmetric Biraphid Genera				
<i>Amphora</i>	Distinguish from <i>Halamphora</i>	2	4	5
<i>Halamphora</i>	Distinguish from <i>Amphora</i>	3	3	5
<i>Cymbella</i>	Distinguish <i>Cymbella</i> , <i>Encyonema</i> , <i>Encyonopsis</i> , <i>Cymbopleura</i> , <i>Delicata</i>	4	1	4
<i>Encyonema</i>	Distinguish <i>Cymbella</i> , <i>Encyonema</i> , <i>Encyonopsis</i> , <i>Cymbopleura</i> , <i>Delicata</i>	4	1	4
<i>Gomphonema</i>	Distinguish <i>Gomphonema</i> , <i>Gomphoneis</i> , <i>Gomphosphenia</i>	4	1	4
<i>Delicata</i>	Distinguish <i>Cymbella</i> , <i>Encyonema</i> , <i>Encyonopsis</i> , <i>Cymbopleura</i> , <i>Delicata</i> Soon, DONA will reflect the transfer to <i>Delicatophycus</i>	1	3	3
<i>Encyonopsis</i>	Distinguish <i>Cymbella</i> , <i>Encyonema</i> , <i>Encyonopsis</i> , <i>Cymbopleura</i> , <i>Delicata</i>	3	1	3
<i>Gomphosphenia</i>	Distinguish <i>Gomphonema</i> , <i>Gomphoneis</i> , <i>Gomphosphenia</i>	3	1	3
<i>Reimeria</i>		3	1	3
<i>Rhoicosphenia</i>	Distinguish from <i>Gomphonema</i> , <i>Gomphoneis</i> , <i>Gomphosphenia</i> . Check girdle view	3	1	3
<i>Cymbopleura</i>		2	1	2
<i>Gomphoneis</i>	Distinguish <i>Gomphonema</i> , <i>Gomphoneis</i> , <i>Gomphosphenia</i>	2	1	2
<i>Didymosphenia</i>	You better not miss this one:)	1	1	1
<i>Navicymbula</i>	Distinguish from <i>Navicula</i> , <i>Encyonopsis</i>	1	1	1
Keeled Genera				
<i>Nitzschia</i>	Distinguish from <i>Tryblionella</i>	4	4	5
<i>Psammodictyon</i>	Distinguish from <i>Tryblionella</i>	1	6	5
<i>Epithemia</i>	Soon, DONA will include transfer of <i>Rhopalodia</i> to <i>Epithemia</i>	4	1	4
<i>Simonsenia</i>	Distinguish from <i>Nitzschia</i> , <i>Denticula</i>	3	2	4
<i>Surirella</i>	Soon, DONA will reflect transfer of some <i>Surirella</i> to <i>Iconella</i>	4	1	4
<i>Bacillaria</i>		3	1	3
<i>Denticula</i>	Distinguish from <i>Simonsenia</i>	3	1	3

Genus	Notes	Abundance	Difficulty	No. of Images
Keeled Genera, continued				
<i>Hantzschia</i>	Distinguish from <i>Nitzschia</i>	3	1	3
<i>Tryblionella</i>	Distinguish from <i>Nitzschia</i>	3	1	3
<i>Campylodiscus</i>	Soon, DONA will reflect the recent transfer of <i>Campylodiscus</i> to <i>Iconella</i>	1	1	1
<i>Cymatopleura</i>	Not on the exam. Subsumed into <i>Surirella</i> . https://diatoms.org/genera/cymatopleura#updates			
<i>Cymbellonitzschia</i>	Distinguish from <i>Nitzschia</i>	1	1	1
<i>Entomoneis</i>		1	1	1

Abundance was assigned using relative abundance data from national surveys of rivers and lakes.

Abundance values: 4 = common; 3 = less common; 2 = not common; 1 = rare.

Difficulty was assigned using results of random forest analysis which detected genera with analyst as one of the top 5 predictors of relative abundance (Lee et al. 2019 doi: 10.1016/j.ecolind.2019.01.061).

Difficulty values: 6 = analyst is 1st predictor; 5 = analyst is 2nd predictor; 4 = analyst is 3rd predictor; 3 = analyst is 4th predictor; 2 = analyst is 5th predictor; 1 = analyst is not one of top 5 predictors.

No. of images is the potential number of image collages that may appear on an exam by random selection and are based on the means of the abundance and difficulty values.

DONA is Diatoms of North America (diatoms.org).